MATEMATIKA

2016

MATEMATIKA

2016.1.

1. $a=-4$ bo'lsa,

$$\int_{a}^{a+1}(\ln(\sin^2 2x+\cos^2 2x)+1)dx$$

aniq integralni hisoblang.

A) $\frac{ln2-1}{2}$ B) $2\sqrt{2}$ C) 1 D) $\sqrt{2}$

2. $3^{3x}-3^x=720$ tenglamani yeching.

A) 2 B) 4 C) 5 D) 3

3. 1,2,3,4,5,6 raqamlardan faqat bir martadan foydalanib ikkita uch xonali sonlar hosil qilish mumkin, masalan, 645 va 321 . Bu raqamlardan ikkita uch xonali sonlar tuzilganda, ular musbat ayirmasining eng kichik qiymati nechaga teeng bo'ladi?

A) 48 B) 47 C) 56 D) 69

4. Akvariumning bo'yi 80 sm, eni 60 sm, balandligi 40 sm. Suv sathi yuqoridan 10 sm pastda bo'lishi uchun akvariumga necha litr suv quyish kerak?

A) 288 B) 144 C) 140 D) 72

5. To'g'ri burchakli ABC uchburchak CD balandlik bilan BCD va ACD uchburchaklarga bo'lingan. Shu uchburchaklar yarim perimetrlari mos ravishda 20 va 21 ga teng. ABC uchburchakning yarim perimetrini toping.

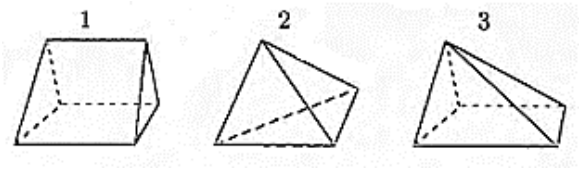
A) $24\sqrt{2}$ B) 26 C) 42 D) 29

6. $y=f(x)$ funksiyada D to'plamda noqat'iy kamayuvchi bo'lsin. D to'plamdan olingan ixtiyoriy a,b elementlar uchun $(a>b)$ quyidagi munosabatlarning qaysi biri o'rinli?

A) $f(a)\le f(b)$ B) $f(b)\le f(a)$ C) $f(a)<f(b)$

D) $f(a)=f(b)$

7. Quyidagi ko'pyoqlarning qaysi birida 4 ta yoq bor?



A) 1, 3 B) 3 C) 1 D) 2

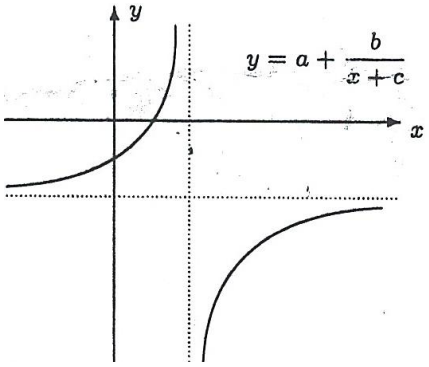
8. Hisoblang : $\sin\frac{\pi}{18}\sin\frac{5\pi}{18}\sin\frac{7\pi}{18}$

A) $\frac{1}{8}$ B) $\frac{\sqrt{2}}{4}$ C) $\frac{\sqrt{2}}{2}$ D) $\frac{\sqrt{3}}{8}$

9. $y>0$ bo'lsin. To'rtburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quydagicha $A(0;0),B(0;y),C(10;y),D(12;0)$ berilgan. To'rtburchak diagonallarining o'rtalari orasidagi masofani toping.

A) 1 B) $\sqrt{2}$ C) 2 D) *y ga bog'liq*

10. Rasmda $y=a+\frac{b}{x+c}$ funksiya grafigi tasvirlangan. Quydagilardan qaysi biri doim o'rinli?



A) $a^3-b^3>0$ B) $C^2-b^2>0$ C) $a^2-b^2c>0$

D) $abc>0$

11. $\frac{2-x^2-x}{x^2+x}\ge 0$ tengsizlikni yeching.

A) $[-2;-1]\cup(0;1)$ B) $[-2;-1)\cup(0;1)$

C) $(-5;-2]\cup[1;3)$ C) $[-5;-2)\cup(1;3]$

12. $\begin{cases}x^2+y^2+xy=3\\ x^4+y^4=2\end{cases}$ tenglamalar sistemasining manfiy sonlardan iborat $(x;y)$ yechimlar juftligi sonini toping.

A) 1 B) 2 C) 0 D) 3

13. $y=\log_5(\sin^2 x+\cos^2 x)$ funksiyaning $x=\frac{1}{2}$ nuqtadagi hosilasini toping.

A) $-\log_5 2$ B) $\log_5 2$ C) 1 D) 0

14. O'zaro teng bo'lmagan x va y sonlari $x^2+26y=y^2+26x$ tenglikni qanoatlantirsa, $x+y$ ni toping.

A) 26 B) 0 C) 16 D) 24

15. $\sqrt[3]{x-2}-\sqrt[3]{x-4}=-\sqrt[3]{3x-8}$ tenglama nechta butun yechimga ega?

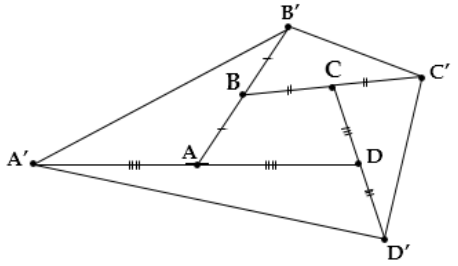
A) 0 B) 2 C) 1 D) 3

16. Hisoblang:

$$\log_{2\sqrt{2}}\left(\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right)\ldots\left(1+\frac{1}{15}\right)\right)$$

A) -3 B) 3 C) 2 D) $\frac{1}{2}$

17. ABCD to'rtburchakning har bir tomoni chizmada ko'rsatilgandek o'z uzunligiga teng uzoqlikda davom ettirilgan. Agar $A'B'C'D'$ to'rtburchak yuzasi 5 ga teng bo'lsa, ABCD to'rtburchak yuzasini toping.



A) 4 B) 2,5 C) 3 D) 1

18. Hisoblang: $1{,}5+\text{tg}^2\left(\arccos\frac{1}{3}\right)$

A) 8,5 B) 9,5 C) 7 D) -7,5

19. To'g'ri burchakli uchburchak tomonlariga yasalgan kvadratlar yuzalarining yig'indisi 48 ga teng. Gepotenuza uzunligini toping.

A) 10 B) $2\sqrt{6}$ C) $2\sqrt{3}$ D) 12

20. Nechta butun son

$$\log_{0,5}(4^x-5*2^x+6)\geq -1$$

tengsizlikning yechimi bo'ladi.

A) 1 B) 2 C) *cheksiz ko'p* D) 3

21. Ushbu $f(x)=\frac{2x+1}{x^2+x-2}$ funksiyaning boshlang'ich funksiyasini toping.

A) $\ln(|x-1|\cdot|x+2|)+C$ B) $\frac{2x^2}{(x-1)(x+2)}+C$

C) $\ln|x+2|+C$ D) $\ln(x-1)+C$

22. Velosipedchi tepalikka 12 *km/soat* tezlik bilan chiqdi. Chiqqan yo'li orqali 20 *km/soat* tezlik bilan pastga tushdi va chiqishdagiga qaraganda 16 *min* kamroq vaqt sarfladi. Yo'lning uzunligini (*km*) toping.

A) 12 B)10 C) 8 D) 14

23. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quydagicha berilgan: $A(0;0)$, $B\left(\frac{1}{2};2\right)$, $C(1;0)$. Uchburchak yuzini toping.

A) $\sqrt{3}$ B) 1 C) 2 D) $\sqrt{2}$

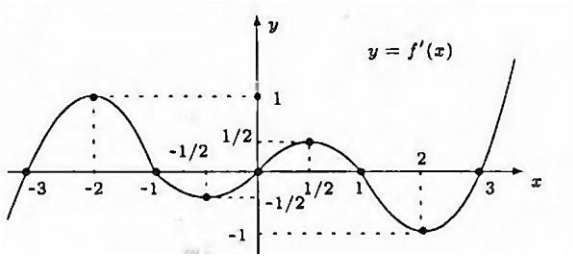
24. Agar barcha x va y lar uchun

$$x^3+4x^2y+axy^2+3xy-bx^cy+7xy^2+dxy+y^2=x^3+y^2$$

ayniyat bajarilsa, $|a+b+c|(a+b+c+d)$ ni toping $c>1$.

A) 2 B) -1 C) -4 D) -3

25. Rasmda $y=f'(x)$ funksiya grafigi tasvirlangan. $y=f(x)$ funksiyaning $3>x\geq 0$ oraliqdagi o'sish oralig'ini toping.



A)$(0;2)\cup(3;\infty)$ B) $\left(0;\frac{1}{2}\right)\cup(2;\infty)$

C) $(1;3)$ D) $(0;1)$

26. $y=-x^2+6x-1$ funksiyaning simmetriya o'qi koordinatasi va $(5;8)$ nuqta orasidagi masofani toping.

A) 3 B) 8 C) 2 D) 7

27. R radiusli sferaga muntazam to'rtburchakli piramida ichki chizilgan. Uchidagi yassi burchagi 30° ga teng bo'lsa, piramida yon sirtining yuzini toping.

A) $2R^2$ B) $3R^2\sqrt{3}$ C) $R^2\sqrt{3}$ D) $2R^2\sqrt{3}$

28. $\{x : x \in \mathbb{N}, 6 \le x^2 \le 42\}$ to'plamning nechta qism to'plamlari mavjud.

A) 8 B) 32 C) 16 D) 5

29. a va b natural sonlarning eng katta umumiy bo'luvchisi 3 ga teng bo'lsa, $a+3b$ va b sonlarning eng katta umumiy bo'luvchisi nimaga teng?

A) 4 B) *bir qiymatli aniqlab bo'lmaydi* C) 1 D) 3

30. Arifmetik progressiya $n-$hadi $a_n = -\frac{n+1}{5}$ ga teng. Progressiyaning ayirmasini toping.

A) -2 B) $-0{,}2$ C) -1 D) $-0{,}5$

MATEMATIKA

2016.2.

1. $x^{\lg 5} \cdot 5^{-\lg x} = 1$ tenglamani yeching.

A) $(0;+\infty)$ B) $\{-1\} \cup (1;+\infty)$ C) $(-1;1)$ D) $(0;1)$

2. $9^{\sin^2 x} - 9^{\cos^2 x} = 8$ tenglamaning $[0;2\pi]$ kesmadagi ildizlari yig'indisini toping.

A) 270° B) 540° C) 360° D) 630°

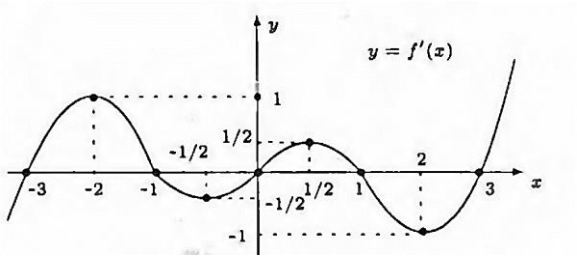
3. $y = -6\sin^2 x + \frac{3}{4}\cos^2 2x + 2\frac{1}{4}$ funksiyaning eng kichik butun qiymatining eng katta manfiy butun qiymatiga nisbatini toping.

A) $\frac{1}{3}$ B) 3 C) -1 D) -3

4. C nuqta – AB kesmaning o'rtasi. AC va BC kesmalarda mos ravishda M, N nuqtalar shunday olinganki, $AM{:}MC{=}CN{:}NB$ munosabat bajariladi. Agar AB kesma uzunligi 36 ga teng bo'lsa, MN kesma uzunligini toping.

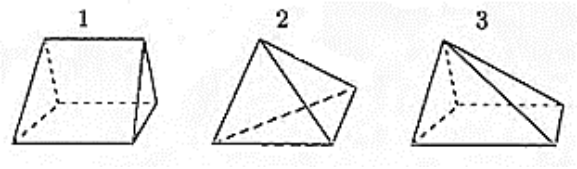
A) 12 B) 9 C) 24 D) 18

5. Rasmda $y = f'(x)$ funksiya grafigi tasvirlangan. $y = f(x)$ funksiya grafigi $x_1 = 2$ va $x_2 = 3$ abssisali nuqtalarda o'tkazilgan urinmalar orasidagi o'tkir burchakni aniqlang.



A) $\frac{\pi}{3}$ B) $\frac{\pi}{4}$ C) 0 D) $\frac{\pi}{6}$

6. Quydagi ko'pyoqlardan qaysi birida 5 ta yoq, 9 ta qirra bor?



A) 1 B) 1, 2 C) 2 D) 3

7. $5 \cdot 0{,}2^{\lg x} > 0{,}04^{\lg 2}$ tengsizlikni yeching.

A) $(10;50)$ B) $(10;50]$ C) $(0;40)$ D) $[1;40]$

8. Velosipedchi tepalikka 12 *km/soat* tezlik bilan chiqdi. Chiqqan yo'li orqali 20 *km/soat* tezlik bilan pastga tushdi va chiqishdagiga qaraganda 16 *min* kamroq vaqt sarfladi. Yo'lning uzunligini (*km*) toping.

A) 14 B) 8 C) 12 D) 10

9. Aylanaga tashqi chizilgan $ABCD$ to'rtburchakda AB va CD tomonlar uzunliklari mos ravishda 2 va 3 ga teng bo'lsa $AD{+}BC$ ni toping.

A) 5 B) 3 C) 6 D) 2

10. Beshta a_1, a_2, a_3, a_4, a_5 tub sonlar ayirmasi 6 ga teng bo'lgan arfmetik progressiyani tashkil qiladi. a_3 ni toping.

A) 19 B) 17 C) 23 D) 11

11. $y = \ln\left(\text{arctg}3x + \text{arcctg}3x - \frac{\pi}{2} + 1\right)$ funksiyaning $x = \frac{1}{2}$ nuqtadagi qiymatini hisoblang.

A) $-\ln 2$ B) 1 C) 0 D) $\ln 2$

12. $y = 4 - x^2$; $y = 0$ chiziqlar bilan chegaralangan shaklning yuzini toping.

A) $8\frac{2}{3}$ B) 8 C) $10\frac{2}{3}$ D) 12

13. Poyezd 5 *minut*da 9 *km* masofani, motosikl 6 *minut*da 9 *km* masofani bosib o'tdi. Motosiklchining tezligi poyezd tezligining necha foizini tashkil etadi.

A)80% B) $81\frac{2}{3}\%$ C) $83\frac{1}{3}\%$ D) $63\frac{1}{3}\%$

14. Agar $\text{ctg}^2\alpha = 1{,}5$ va $\alpha\epsilon\left(0;\frac{\pi}{2}\right)$ bo'lsa, $\cos^2\alpha - \sin^2\alpha$ ni hisoblang.

A) $\frac{1}{5}$ B) $\frac{1}{4}$ C) $\frac{1}{2}$ D) $-\frac{1}{5}$

15. Qirralari 11, 13 va 17 bo'lgan parallelopiped qirrasi 1 ga teng bo'lgan kubchalardan tshkil topgan. Parallelopipeddan 1 kubcha qalinligidagi tashqi sirt olib tashlash uchun nechta kubcha olinishi kerak.

A) 944 B) 511 C) 946 D) 513

16. To'g'ri burchakli ABC uchburchak CD balandlik bilan BCD va ACD uchburchaklarga bo'lingan. Shu uchburchaklarga ichki chizilgan aylanalar radiuslari mos ravishda 5 va 12 ga teng. ABC uchburchakka ichki chizilgan aylana radiusini toping.

A) $8\sqrt{2}$ B) 13 C) 14 D) 17

17. $|x^2 - 2x| \le x$ tengsizlikni qanoatlantruvchi tub sonlar yig'indisini toping.

A) 5 B) 10 C) 2 D) 3

18. $2\sqrt{2}$ radiusli sferaga muntazam to'rtburchakli piramida ichki chizilgan. Uchidagi yassi burchagi 45° ga teng bo'lsa, piramida yon sirtining yuzini toping.

A) 28 B) 32 C)$16\sqrt{2}$ D) 36

19. $\{x: x \in \mathbb{N}, x^2 < 33\}$ to'plamni nechta usul bilan ikkita kesishmaydigan qism to'plamlarga ajratish mumkin?

A) 16 B) 33 C) 5 D) 32

20. Agar $m = 64$ bo'lsa,

$$\log_7\left(\frac{\sqrt{m}+27}{\sqrt[3]{m}-2\sqrt[6]{m}-15} : \frac{\sqrt[3]{m}-3\sqrt[6]{m}+9}{\sqrt[3]{m}-25}\right)$$

ni hisoblang.

A) $\log_7 2$ B) -1 C) 0 D) 1

21. $y = \text{arctg}x$ funksiya grafigi berilgan bo'lib, uni parallel ko'chirish yordamida $y = \text{arctg}(x + a) + b$ funksiyaning grafigi hosil qilingan. Bunday parallel kochirishda koordinata boshi qanday nuqtaga ko'chadi?

A) $N(-a; b)$ B) $N(a; b)$ C) $N(b; a)$ D) $N(a; -b)$

22. O'zaro teng bo'lmagan x va y sonlari $x^2 + 26y = y^2 + 26x$ tenglikni qanoatlantirsa, $x + y$ ni toping.

A) 0 B) 26 C) 16 D) 24

23. $[4; 100]$ kesmada $2, 3, 5$ va 7 sonlariga bo'linganida qoldiq 1 ga teng bo'ladigan natural sonlar nechta?

A) 3 B) 0 C) 1 D) 2

24. $y > 0$ bo'lsin. To'rtburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quydagicha berilgan: $A(0; 0), B(0; y), C(10; y), D(12; 0)$. To'rtburchak diagonallarining o'rtalari orasidagi masofani toping.

A) 2 B) $\sqrt{2}$ C) 1 D) *y ga bog'liq*

25. $(x; y)$ sonlar jufti $\begin{cases}\frac{4x-3y}{6}+\frac{5y-2x}{3}=0\\ \frac{6x+7y}{2}-\frac{4x-3y}{4}=2\end{cases}$ sistemaning yechimi bo'lsa, $x^2 - y^2$ ni toping.

A) -1 B) 0 C) 2 D) 1

26. $y = \ln(\text{arctg}2x + \text{arcctg}2x)$ funksiyaning $x = \frac{1}{2}$ nuqtadagi hosilasining qiymatini toping.

A) 0 B) ln2 C) 1 D) – ln2

27. $\alpha = 7{,}5°$, $a = (\text{tg}\alpha)^{\text{tg}\alpha}$, $b = (\text{tg}\alpha)^{\text{ctg}\alpha}$, $c = (\text{ctg}\alpha)^{\text{tg}\alpha}$ bo'lsa, quyidagilardan qaysi biri o'rinli?

A) $b > a > c$ *B)* $b > c > a$ *C)* $b > a > c$

D) $c > a > b$

28. Ushbu $f(x) = \frac{x-6}{x-5}$ funksiyaning boshlang'ich funksiyasini toping.

A) $\ln(x-5)^2+C$ B) $\frac{2x^2}{(x-5)^2}+C$

C) $x-\ln|x-5|+C$ D) $x+\ln|x-5|+C$

29. Ifodani soddalashtring:

$$\frac{1-\text{tg}^2\frac{\alpha}{2}}{1+\text{tg}^2\frac{\alpha}{2}}-\frac{1+\sin 2\alpha}{\sin\alpha+\cos\alpha},\ \alpha\in\left(0;\frac{\pi}{2}\right)$$

A) $\sin\alpha$ B) $2\text{tg}\alpha$ C) $\sin\alpha+1$ D) $-\sin\alpha$

30. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quyidagicha berilga $A(0;0), B(-1;-2), C(-2;0)$.
Uchburchak yuzini toping.

A) 3 B) $2\sqrt{2}$ C) 2 D) $2\sqrt{3}$

MATEMATIKA

2016.3.

1. Poyezd 3 minutda 8 kilometr masofani, motosikl 4 minutda 8 kilometr masofani bosib o'tdi. Motosiklning tezligi poyezd tezligining necha foizini tashkil etadi?

A) 77% B) 75% C) 67% D) 73%

2. Hisoblang:

$$\frac{\cos^2 31^\circ}{4\sin^2 31^\circ+3\cos 62^\circ-1}$$

A) 0,5 B) -2 C) 2 D) 1

3. Qavariq ko'pburchakning bittasidan tashqari qolgan barcha burchaklari yig'indisi 2198° ga teng. Ko'pburchakning tomonlari sonini toping.

A) 16 B) *aniqlab bo'lmaydi* C) 14 D) 15

4. $a=-b, c=3$ bo'lsa,

$$\frac{c(a-b)^3+a(b-c)^3+b(c-a)^3}{c^2(b-a)+b^2(a-c)+a^2(c-b)}$$

ifodaning qiymatini toping.

A) 0 B) 3 C) -3 D) 1

5. Hisoblang: $\cos\left(\text{arctg}\frac{1}{3}+\text{arctg}\frac{1}{2}\right)$

A) $-\frac{\sqrt{3}}{3}$ B) $\frac{\sqrt{3}}{3}$ C) $\frac{\sqrt{2}}{2}$ D) $-\frac{\sqrt{2}}{2}$

6. $\log_{\frac{1}{9}}\log_{\frac{1}{4}}\frac{x+4}{2x-1}<0$ tengsizlikni qanoatlantiradigan eng kichik butun sonni toping.

A) -8 B) -10 C) 0 D) -5

7. $a=(0{,}2)^{\frac{1}{2}\log_5 16-\log_{25}2^8}$ bo'lsa, $\log_2 a$ ni toping.

A) 0,5 B) $\log_2 5$ C) 2 D) 1

8. Agar $f(x)=g(h(x))$ va $h(x)=2x^2-3x$ funksiyalar berilgan va $f'(-1)=14$ bo'lsa, $g'(5)$ ni hisoblang.

A) -2 B) 14 C) -7 D) -35

9. $x^4-29x^2+100=0$ tenglamani yeching.

A) $\emptyset$ B) $\pm2;\ \pm5$ C) $\pm4;\ \pm10$ D) $\pm2;\ \pm10$

10. Agar barcha x va y lar uchun

$$x^3+4x^2y+axy^2+3xy-bx^cy+7xy^2+dxy+y^2=x^3+y^2$$

ayniyat bajarilsa, a ni toping.

A) -7 B) 4 C) -3 D) 2

11. Ushbu $f(x)=\frac{x+3}{x+4}$ funksiyaning boshlang'ich funksiyasini toping.

A) $x-\ln|x+4|+C$ B) $\frac{2x^2}{(x+4)^2}+C$

C) $\ln(x+4)^2+C$ D) $x+4\ln|x+4|+C$

12. $\{x|x\in\mathbb{N}, 5\le x^2\le 39\}$ to'plamning nechta xosmas qism – to'plami mavjud?

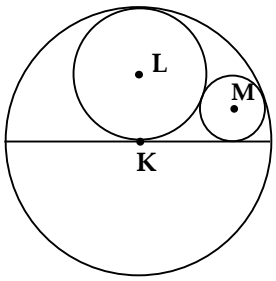
A) 2 B) 5 C) 16 D) 32

13. $a_1, a_2, \dots, a_8$ ketma – ketlikda ixtiyoriy uchta ketma – ket hadining yig'indisi 50 ga teng. Agar ketma – ketlikning uchinchi hadi 8 ga teng bo'lsa, birinchi va sakkizinchi hadlarning yig'indisini toping.

A) 44 B) 42 C) 16 D) 8

14. AB kesma K aylananing diametri bo'lsin. L aylana K aylanaga hamda AB to'g'ri chiziqqa K aylananing markazida urinadi; M aylana K va L aylanaga hamda AB to'g'ri chiziqqa urinadi (chizmaga qarang). Agar

M aylana radiusi $\frac{1}{2}$ ga teng bo'lsa, L aylana radiusini toping.



A) *aniqlab bo'lmaydi* B) 1 C) 2 D) 3

15. Nechta tub son $|x^2-2x| \le x$ tengsizlikning yechimi bo'ladi?

A) 1 B) 2 C) 3 D) 0

16. $|x-3|^{3x^2-10x+3}=1$ tenglamaning butun yechimlarini toping.

A) 2 *va* 4 B) 2 *va* -4 C) -2 *va* 4

D) -2 *va* -4

17. $4x^2-\sqrt{x^2}-3=0$ tenglama ildizlari ko'paytmasini toping.

A) 1 B) 2 C) -4 D) -1

18. $y>0$ bo'lsin. To'rtburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quydagicha berilgan: $A(1;0), B(1;y), C(4;y)$ va $D(6;0)$. To'rtburchak diagonallarining o'rtalari orasidagi masofani toping.

A) 2 B) $\sqrt{2}$ C) *y ga bog'liq* D) 1

19. Qirrasi $5\sqrt{3}$ ga teng bo'lgan kubning qo'shni yoqlarining ayqash diagonallari orasidagi masofani toping.

A) $4\sqrt{2}$ B) $3\sqrt{3}$ C) 6 D) 5

20. $y=f(x)$ funksiya minimum nuqtasi x_0 bo'lsin. U holda qaysi tengsizlik x_0 ning qandaydir atrofida barcha x lar uchun o'rinli?

A) $f(x) \ge f(x_0)$ B) $f(x) \le f(x_0)$
C) $f(x) > f(x_0)$ D) $f(x) < f(x_0)$

21. $[50;300]$ kesmada 3 ga bo'lganda qoldiq 1 ga, 4 ga bo'lganda qoldiq 2 ga, 5 ga bo'lganda qoldiq 3 ga va 6 ga bo'lganda qoldiq 4 ga teng bo'ladigan natural sonlar nechta?

A) 2 B) 3 C) 4 D) 5

22. Uchburchaklning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quyidagicha berilgan: $A(0;0), B\left(-\frac{1}{2};10\right), C(-1;0)$. Uchburchak yuzini toping.

A) 5 B) $3\sqrt{3}$ C) 4 D) $4\sqrt{2}$

23. $y=\frac{1}{x^2}$; $y=0$; $x=1$; $x=2$ chiziqlar bilan chegaralangan shaklning yuzini toping.

A) 2,5 B) 0,5 C) 2 D) 4

24. $60°$ ga teng bo'lgan A burchakka aylana ichki chizilgan. Bu aylana burchak tomonlariga B va C nuqtalarda urinadi. Agar $BC=5$ bo'lsa, AC ni toping.

A) *bir qiymatli aniqlab bo'lmay*di B) 3 C) 5 D) 4

25. Parallepipedning asoslari tomoni $3\sqrt{2}$ ga teng kvadratlardan, barcha yon yoqlari romblardan iborat. Yuqori asosining uchlaridan biri ostki asosining uchlaridan baravar uzoqlikda joylashgan. Parallepipedning hajmini toping.

A) 54 B) $9\sqrt{2}$ C) $27\sqrt{2}$ D) 27

26. $y=|x-2|+|x-3|+|x-4|$ funksiyaning eng kichik qiymatini toping.

A) 1 B) 3 C) 0 D) 2

27. Musbat x va y sonlar uchun $a=\frac{x+4y}{2}$ va $b=2\sqrt{xy}$ bo'lsin. Qaysi tengsizlik har doim o'rinli?

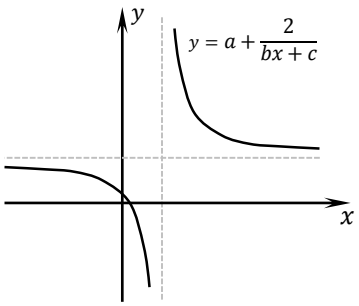
A) $a \le b$ B) $a < b$ C) $a > b$ D) $a \ge b$

28. Agar $f(x)=7^x \cdot 3x$ bo'lsa, $f'(x)>0$ tengsizlikni yeching.

A) $(-\log_7 e; e)$ B) $(-\log_7 e; +\infty)$

C) $(-2\log_7 e; +\infty)$ D) $(-\infty; -\log_7 e)$

29. Rasmda $y=a+\frac{2}{bx+c}$ funksiyaning grafigi tasvirlangan. Quyidagilardan qaysi biri noto'g'ri?



A) $bc + a > 0$ B) $ab > 0$ C) $ac - b > 0$ D) $a + ab > 0$

30. Asosi a ga, yon tomoni b ga teng bo'lgan teng yonli uchburchakning yon tomoniga tushirilgan balandlik uzunligini toping.

A) $h_b = \frac{a}{2b}\sqrt{4b^2 - a^2}$ B) $h_b = \frac{b}{2a}\sqrt{4b^2 - a^2}$

C) $h_b = \frac{b}{a}\sqrt{4b^2 - 2a^2}$ D) $h_b = \frac{a}{b}\sqrt{4b^2 - 2a^2}$

MATEMATIKA

2016.4.

1. Asosi a ga, yon tomoni b ga teng bo'lgan teng yonli uchburchakning yon tomoniga tushirilgan balandlik uzunligini toping.

A) $h_b = \frac{a}{2b}\sqrt{4b^2 - a^2}$ B) $h_b = \frac{b}{2a}\sqrt{4b^2 - a^2}$

C) $h_b = \frac{b}{a}\sqrt{4b^2 - 2a^2}$ D) $h_b = \frac{a}{b}\sqrt{4b^2 - 2a^2}$

2. $|x + 5|^{x^2-1} \geq 1$ tengsizlikni qanoatlantirmaydigan eng katta butun sonni toping.

A) 0 B) -1 C) -2 D) 3

3. Beshta a_1, a_2, a_3, a_4, a_5 tub sonlar ayirmasi 6 ga teng bo'lgan arifmetik progressiya tashkil qiladi. $2a_1 + a_2$ ni toping.

A) 21 B) 37 C) 34 D) 27

4. $y = -x^2 + 6x - 1$ funksiyaning simmetriya o'qi koordinatasi va $(5; 8)$ nuqta orasidagi masofani toping.

A) 2 B) 8 C) 3 D) 7

5. O'zaro teng bo'lmagan a va b sonlari $a^2 + 36b = b^2 + 36a$ tenglikni qanoatlantirsa, $\sqrt[4]{a^2 + 2ab + b^2}$ ni toping.

A) $\sqrt{18}$ B) 0 C) $\sqrt{24}$ D) 6

6. Sharga asosining tomoni $5\sqrt{2}$ ga, balandligi 10 ga teng bo'lgan muntazam to'rtburchakli piramida ichki chizilgan. Shar radiusini toping.

A) 6,25 B) 24 C) 6 D) 6,5

7. $[50; 250]$ kesmada 3 ga bo'lganda qoldiq 1 ga, 4 ga bo'linganda qoldiq 2 ga, 5 ga bo'linganda qoldiq 3 ga va 6 ga bo'linganda qoldiq 4 ga teng bo'ladigan natural sonlar nechta?

A) 3 B) 2 C) 4 D) 1

8. $y = \log_5(\text{arctg}2x + \text{arcctg}2x)$ funksiyaning $x = \frac{1}{2}$ nuqtadagi hosilasining qiymatini toping.

A) $\log_5 2$ B) 0 C) $-\log_5 2$ D) 1

9. $60°$ ga teng bo'lgan A burchakka aylana ichki chizilgan. Bu aylana burchak tomonlariga B va C nuqtalarda urinadi. Agar $BC = 2$ bo'lsa, ABC uchbrchak perimetrini toping.

A) 5 B) 7 C) *bir qiymatli aniqlab bo'lmay*di D) 6

10. To'g'ri burchakli trapetsiyaning asoslari 5 va 1 ga teng. Unga ichki chizilgan aylana radiusini toping.

A) 0,5 B) $\frac{5}{6}$ C) $\frac{1}{6}$ D) 0,2

11. Agar barcha x va y lar uchun

$$x^3 + 4x^2y + axy^2 + 3xy - bx^cy + 7xy^2 + dxy + y^2 = x^3 + y^2$$

ayniyat bajarilsa, $|a + b + c|(a + c)$ ni toping. $(c > 1)$

A) 4 B) 2 C) -5 D) -3

12. $y = 3\sin 4x + 2\sin 6x$ funksiyaning hosilasini toping.

A) $24\sin x \cdot \cos 5x$ B) $-24\cos x \cdot \sin 5x$
C) $24\cos x \cdot \cos 5x$ D) $24\sin x \cdot \sin 5x$

13. $3(\sin^4\beta+\cos^4\beta)-2(\sin^6\beta+\cos^6\beta)$ ifodaning $\beta=\frac{13\pi}{12}$ bo'lgandagi qiymatini toping.

A) $\frac{\sqrt{3}}{2}$ B) $\sqrt{3}$ C) $\frac{\sqrt{2}}{2}$ D) 1

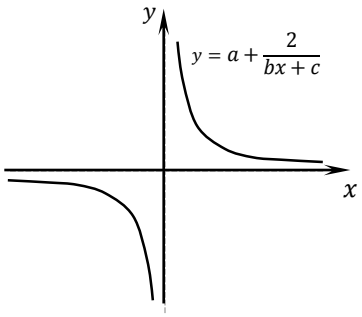
14. Hisoblang: $\log_6\left(\sqrt{2-\sqrt{3}}+\sqrt{2+\sqrt{3}}\right)$

A) $\log_6\sqrt{3}$ B) $\log_6 2$ C) $\frac{1}{2}$ D) 1

15. $\{x|x\in\mathbb{N},-6<x<5\}$ to'plamni nechta usul bilan ikkita kesishmaydigan qism – to'plamlarga ajratish mumkin?

A) 16 B) 4 C) 8 D) 10

16. Rasmda $y=a+\frac{2}{bx+c}$ funksiyaning grafigi tasvirlangan. Quyidagilardan qaysi biri noto'g'ri?



A) $c(a-b)=0$ B) $b-a=0$ C) $bc-a^2=0$
D) $ac=0$

17. $\sqrt{3}(4^x+2^{2x-1})<3^x+3^{x+1}$ tengsizlikni yeching.

A) $(-\infty;1{,}5)$ B) $(-\infty;-1)\cup(-1;0)\cup(1;+\infty)$
C) $(0;2)$ D) $(-\infty;0)\cup(0;3)$

18. A va B to'plamlarning kamida bittasida mavjud bo'lgan barcha elementlardan tuzilgan to'plam qanday nomlanadi?

A) *Universal to'plam*
B) *A va B to'plamlarning birlashmasi*
C) *A va B to'plamlarning kesishmasi*
D) *A va B to'plamlarning ko'paytmasi*

19. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quyidagicha berilgan: $A(0;0),B\left(-\frac{1}{2};10\right),C(-1;0)$. Uchburchak yuzini toping.

A) 5 B) 4 C) $3\sqrt{3}$ D) $4\sqrt{2}$

20. Tenglamaning manfiy butun yechimlari nechta?

$$\log_2\left(2\sqrt{x+5}+5\right)+\log_{0,5}(-x-0{,}5)=1$$

A) 2 B) 1 C) 0 D) 3

21. $3\cdot16^x+36^x-2\cdot81^x=0$ tenglamaning ildizlari yig'indisini toping.

A) 2 B) 1 C) 0,25 D) 0,5

22. Samandar doskaga ikkita son yozdi. Uchinchi son sifatida u birinchi va ikkinchi sonlarning yig'indisini, to'rtinchi son sifatida ikkinchi va uchinchi sonlarning yig'indisini va h.k. yozdi, lekin yettinchi sonni yozmadi. So'ng dastlabki oltita sonni qo'shdi va bu yig'indini bilgan holda qo'shiluvchilardan birini aniq hisoblash mumkinligini ko'rdi. Bu qaysi qo'shiluvchi edi?

A) *uchinchi* B) *to'rtinchi* C) *beshinchi*
D) *oltinchi*

23. $D_1(f)$ to'plamda berilgan $f(x)$ va $D_2(\mathrm{g})$ to'plamda berilgan $\mathrm{g}(x)$ funksiyalarning yig'indisi deb, … $\varphi(x)=f(x)+\mathrm{g}(x)$ funksiyaga aytiladi.

A) $D_1(f)\cup D_2(\mathrm{g})$ to'plamda berilgan, bunda $D_1(f)\cap D_2(\mathrm{g})=\emptyset$

B) $D_1(f)\cap D_2(\mathrm{g})$ to'plamda berilgan, bunda $D_1(f)\cap D_2(\mathrm{g})\neq\emptyset$

C) $D_1(f)\cap D_2(\mathrm{g})$ to'plamda berilgan, bunda $D_1(f)\cap D_2(\mathrm{g})=\emptyset$

D) $D_1(f)\cup D_2(\mathrm{g})$ to'plamda berilgan, bunda $D_1(f)\cap D_2(\mathrm{g})\neq\emptyset$

24. $y>0$ bo'lsin. To'rtburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quydagicha berilgan: $A(0;0),B(0;y),C(-6;y)$ va $D(-8;0)$. To'rtburchak diagonallarining o'rtalari orasidagi masofani toping.

A) 1 B) *y ga bog'liq* C) $\sqrt{2}$ D) 2

25. Parallelepipedning asosi tomoni $\sqrt{2}$ ga teng kvadratlardan, barcha yon yoqlari romblardan iborat. Yuqori asosining uchlaridan biri ostki

asosining barcha uchlaridan baravar uzoqlikda joylashgan. Parallepipedning hajmini toping.

A) $\sqrt{2}$ B) 2 C) 1 D) 4

26. Hisoblang: $\operatorname{ctg}45^\circ \cdot \operatorname{ctg}15^\circ \cdot \operatorname{ctg}105^\circ$.

A) 1 B) -1 C) $\frac{\sqrt{2}}{4}$ D) $-\frac{\sqrt{2}}{4}$

27. $a^2b^2x^4 = b^4x^2 - a^2b^2 + a^4x^2$ tenglamada x ni toping. $(a \cdot b \neq 0)$

A) $\pm\frac{a}{b};\ \pm\frac{b}{a}$ B) $\pm\frac{1}{a};\ \pm\frac{1}{b}$ C) $\pm a;\ \pm b$ D) $\emptyset$

28. $a = 1$ bo'lsa, $\int_a^{a+1}\left(\sin^2 3x + \cos^2 3x\right)dx$ integralni hisoblang.

A) $\frac{\sqrt{2}-1}{3}$ B) 1 C) $\sqrt{2}$ D) $2\sqrt{2}$

29. $R = \sqrt[4]{3}$ radiusli sferaga muntazam to'rtburchakli piramida ichki chizilgan. Uchidagi barcha yassi burchak 30° ga teng bo'lsa, piramida yon sirtining yuzini toping.

A) $2\sqrt{3}$ B) 9 C) 3 D) 6

30. Teng yonli uchburchakning yon tomoniga o'tkazilgan mediana va asosi orasidagi burchak tangensi 4 ga teng. Uchburchak asosidagi burchak tangensini toping.

A) 16 B) $2\sqrt{2}$ C) 12 D) 15

MATEMATIKA

2016.5.

1. $y > 0$ bo'lsin. To'rtburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quydagicha berilgan: $A(1;0), B(1;y), C(2;y)$ va $D(4;0)$. To'rtburchak diagonallarining o'rtalari orasidagi masofani toping.

A) 1 B) *y ga bog'liq* C) $\sqrt{2}$ D) 2

2. $ABCD$ tetraedrning D uchidagi barcha yassi burchaklar to'g'ri. Shu tetraedrga kub shunday ichki chizilganki, kubning bitta uchi D nuqtada, unga qarama – qarshi uchi esa ABC yoqda yotibdi. Agar $DA = 2, DB = 3$ va $DC = 4$ bo'lsa, kub qirrasining uzunligini toping.

A) $\frac{11}{12}$ B) $\frac{12}{13}$ C) $\frac{17}{19}$ D) $\sqrt{2}$

3. Qaysi jism(lar)ning simmetriya o'qlari chekli sonda?

1) shar; 2) prizma; 3) konus; 4) kub

A) 2, 3 B) 2, 3, 4 C) 3, 4 D) 1

4. Asoslarining radiuslari 2 va 3 ga teng bo'lgan kesik konus va unga tengdosh silindrning balandliklari bir xil. Silindr asosining radiusini toping.

A) $\sqrt{13}$ B) $\sqrt{19}$ C) $\sqrt{6\frac{1}{3}}$ D) $\sqrt{6\frac{2}{3}}$

5. Aniq integralni hisoblang: $\int_0^2\left(x^3 - 5\sqrt[3]{x^2} + 7\right)dx$

A) $18 - 6\sqrt[3]{4}$ B) $16 - 6\sqrt[3]{4}$ C) $18 + 6\sqrt[3]{4}$ D) $16 + 6\sqrt[3]{4}$

6. $\log_{0,5}(4^x - 5 \cdot 2^x + 6) \geq -1$ tengsizlikni qanoatlantiradigan barcha butun sonlar yig'indisini toping.

A) 2 B) 0 C) -1 D) 4

7. Hisoblang: $\log_5 \frac{7\cdot 3^{n+1} - 8\cdot 3^{n-1}}{3^n + 8\cdot 3^{n-1}}$

A) 0 B) 1 C) $\log_5 2$ D) -1

8. $y = \log_5(\sin^2 x + \cos^2 x)$ funksiyaning $x = \frac{1}{2}$ nuqtadagi ikkinchi tartibli hosilasining qiymatini toping.

A) 0 B) 1 C) $-\log_5 2$ D) $\log_5 2$

9. Agar $x^2 + 20y^2 = 9xy$ bo'lsa, $\frac{x}{y}$ nisbatning eng katta qiymatini toping.

A) 2 B) 9 C) 5 D) 3

10. Beshta a_1, a_2, a_3, a_4, a_5 tub sonlar ayirmasi 6 ga teng bo'lgan arifmetik progressiya tashkil qiladi. $a_4 + a_5$ ni toping.

A) 48 B) 52 C) 42 D) 40

11. $\frac{2x+5}{6}+\frac{10}{x-3}=\frac{2x-3}{6}$ tenglamani yeching.

A) $-4{,}5$ B) 6,75 C) 4,5 D) 7

12. $a=-4$ bo'lsa,

$$\int_{a}^{a+1}(\ln(\sin^2 3x+\cos^2 3x)+1)dx$$

aniq integralni hisoblang.

A) $\frac{ln2-1}{3}$ B) $\sqrt{2}$ C) $2\sqrt{2}$ D) 1

13. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quyidagicha berilgan: $A(0;0), B(1;-2), C(1;0)$. Uchburchak yuzini toping.

A) $\sqrt{3}$ B) 1 C) $\sqrt{2}$ D) 2

14. $f(x)=\frac{x}{x+1}$ funksiya grafigi qaysi choraklardan o'tadi?

A) *I*, *III* – chorak B) *I*, *II* – chorak

C) *I*, *II*, *III* – chorak D) *I*, *II*, *III*, *IV* – chorak

15. $\{x|x\in\mathbb{N}, x^2\le 19\}$ to'plamning nechta qism – to'plamlari mavjud?

A) 32 B) 16 C) 19 D) 4

16. *ABC* teng yonli uchburchakka aylana ichki chizilgan (*AB*=*BC*). *E* nuqta aylananing *AB* tomonidagi urinish nuqtasi va *BE*=4, *EA*=3. *ABC* uchburchak yuzini toping.

A) 18 B) $4\sqrt{10}$ C) $6\sqrt{10}$ D) 12

17. O'zaro teng bo'lmagan x va y sonlari $x^2+16y=y^2+16x$ tenglikni qanoatlantirsa, $x+y$ ni toping.

A) 26 B) 0 C) 16 D) 24

18. Agar barcha x va y lar uchun

$$x^3+4x^2y+axy^2+3xy-bx^cy+7xy^2+dxy+y^2=x^3+y^2$$

ayniyat bajarilsa, $|a+b+c|(a+b+c-d)$ ni toping. $(c>1)$

A) -4 B) -2 C) 3 D) 2

19. Hisoblang: $\cos\frac{2\pi}{5}\cdot\cos\frac{4\pi}{5}\cdot\cos\frac{6\pi}{5}$

A) $\frac{1}{8}$ B) $\frac{1}{4}\cos\frac{\pi}{5}$ C) $-\frac{1}{4}\cos\frac{\pi}{5}$ D) $\frac{1}{4}\sin\frac{\pi}{5}$

20. $y=3\sin 4x+2\sin 6x$ funksiyaning hosilasini toping.

A) $24\cos x\cdot\cos 5x$ B) $24\sin x\cdot\sin 5x$
C) $24\sin x\cdot\cos 5x$ D) $-24\cos x\cdot\sin 5x$

21. a va b natural sonlarning eng katta umumiy bo'luvchisi 3 ga teng bo'lsa, $a+3b$ va b sonlarning eng katta umumiy bo'luvchisi nechaga teng bo'ladi?

A) 1 B) 3 C) *bir qiymatli aniqlab bo'lmaydi* D) 4

22. $2^{x+2}+5^{x+2}>5^{x+1}+2^{x+3}+2^{x+4}$ tengsizlikni yeching.

A) $(0;1)$ B) $(-1;+\infty)$ C) $[-1;0)$ D) $(0;+\infty)$

23. $\frac{\sqrt{6-x-x^2}}{x^2-1}\le 0$ tengsizlikning musbat butun yechimlari nechta?

A) 0 B) 1 C) 3 D) 2

24. $y=2+\cos\frac{x}{2}; y=0; x=0; x=\frac{2\pi}{3}$ chiziqlar bilan chegaralangan shaklning yuzini toping.

A) $\frac{4\pi}{3}+\sqrt{3}$ B) $\frac{\pi}{2}$ C) $\frac{2\pi}{3}+4$ D) $\frac{\pi}{3}+4$

25. $y=f(x)$ funksiya D to'plamda o'suvchi bo'lsin. D to'plamdan olingan ixtiyoriy a, b elementlari uchun $(a>b)$ quyidagi munosabatlardan qaysi biri o'rinli?

A) $f(b)=f(a)$ B) $f(a)<f(b)$ C) $f(b)<f(a)$
D) $f(a)\le f(b)$

26. *SABC* uchburchakli piramidaning *S* uchidagi yassi burchaklari to'g'ri burchak. *SO* – piramida balandligi. *AOB* va *BOC* uchburchaklar yuzalari mos ravishda 16 va 4 ga teng. *ASB* uchburchak yuzasining *BSC* uchburchak yuzasiga nisbatini toping.

A) *aniqlab bo'lmaydi* B) 3 C) 2 D) $\sqrt{2}$

27. Kasrning maxrajini irratsionallikdan qutqaring.

$$\frac{6}{\sqrt[3]{11}-\sqrt[3]{5}}$$

A) $\sqrt[3]{121}-\sqrt[3]{25}$ B) $\sqrt[3]{25}-\sqrt[3]{55}+\sqrt[3]{121}$

C) $\sqrt[3]{25}+\sqrt[3]{55}+\sqrt[3]{121}$ D) $\sqrt[3]{11}+\sqrt[3]{5}+\sqrt[3]{55}$

28. k ning qanday qiymatlarida

$$\frac{1}{x+1}=1-k$$

tenglama manfiy yechimga ega?

A) $k>0; k<1$ B) $k\le 0$ C) $k<1$
D) $k<0; k>1$

29. To'g'ri burchakli uchburchakning gipotenuzasi 9 ga, unga ichki chizilgan aylana radiusi 1 ga teng. Uchburchaning perimetrini toping.

A) 18 B) 28 C) 20 D) 25

30. $4-x<\sqrt{6-x}$ tengsizlikning yechimlaridan iborat bo'lgan eng kichik natural sonni toping.

A) 3 B) 5 C) 4 D) 6

MATEMATIKA

2016.6.

1. $y=-6\sin^2 x+\frac{3}{4}\cos^2 2x+2\frac{1}{4}$ funksiyaning qiymatlari sohasiga tegishli natural sonlar nechta?

A) 2 *ta* B) 3 *ta* C) 4 *ta* D) 5 *ta*

2. $a=2$ bo'lsa, $\int_a^{a+1}\left(\sin^2 2x+\cos^2 2x\right)dx$ integralni hisoblang.

A) $\frac{\sqrt{2}-1}{2}$ B)$\sqrt{2}$ C) 1 D) $2\sqrt{2}$

3. $a=-2$ bo'lsa,

$$\int_a^{a+1}(\ln(\sin^2 2x+\cos^2 2x)+1)dx$$

aniq integralni hisoblang.

A) $\sqrt{2}$ B) 1 C) $\frac{ln2-1}{3}$ D) $2\sqrt{2}$

4. $a_1, a_2, a_3, \dots, a_8$ ketma – ketlikda ixtiyoriy uchta ketma – ket hadining yig'indisi 40 ga teng. Agar ketma – ketlikning uchinchi hadi 6 ga teng bo'lsa, $a_1+a_8=?$

A) 34 B) 12 C) 36 D) 6

5. a va b natural sonlarning umumiy bo'luvchilari soni 3 ga teng bo'lsa, $a+5b$ va b sonlarning umumiy bo'luvchilari nechta?

A) 1 B) 4 C) 3 D) *bir qiymatli aniqlab bo'lmaydi*

6. 123451234512345123451234512345 sonida 10 ta raqam shunday o'chirilganki, hosil bo'lgan son eng katta bo'ldi. Shu sonning 5 – raqamini toping.

A) 2 B) 3 C) 4 D) 5

7. $\log_{\frac{1}{9}}\log_{\frac{1}{4}}\frac{x+4}{2x-1}<0$ tengsizlikni qanoatlantiradigan eng katta butun sonni toping.

A) -4 B) 0 C) -6 D) -5

8. $\{x|x\in\mathbb{N}, 6\le x^2\le 43\}$ to'plamning nechta qism – to'plamlari mavjud?

A) 5 B) 8 C) 16 D) 32

9. $2^{2x+1}-6^x-9^x=0$ tenglamani yeching.

A) 0; 1 B) -1 C) 1 D) 0

10. Qaysi jismlarning simmetriya o'qlari chekli sonda?

1) shar; 2) prizma; 3) konus

A) 3 B) 2 C) 1 D) 2; 3

11. Tenglamani yeching: $\sin\left(\frac{\pi}{5}+\frac{x}{2}\right)=\frac{\sqrt{3}}{2}$

A) $\frac{2\pi}{5}+2\pi k, k\in\mathbb{Z}$

B) $-\frac{2\pi}{5}+(-1)^k\frac{2\pi}{3}+2\pi k, k\in\mathbb{Z}$

C) $-\frac{2\pi}{5}+(-1)^k\frac{2\pi}{3}+\pi k, k\in\mathbb{Z}$

D) $\frac{2\pi}{5}+(-1)^k\frac{2\pi}{3}+2\pi k, k\in\mathbb{Z}$

12. To'g'ri burchakli uchburchakning gipotenuzasi 32 ga, unga ichki chizilgan aylana radiusi 6 ga teng. Uchburchakning perimetrini toping.

A) 76 B) 68 C) 72 D) 36

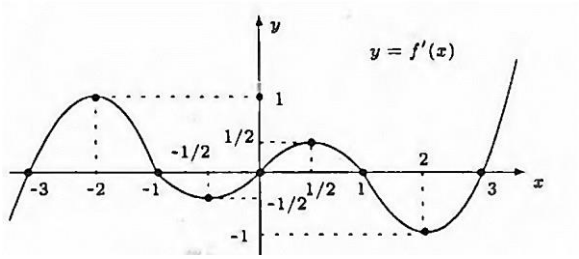
13. To'g'ri burchakli trapetsiyaning asoslari 6 va 2 ga teng. Unga ichki chizilgan aylana radiusini toping.

A) 1,5 B) 1,2 C) 1,6 D) 1,1

14. Agar $|x+3| = \frac{x}{2} + a$ tenglama a parametrning nechta natural qiymatida yechimga ega emas?

A) 0 B) 2 C) 3 D) 1

15. Rasmda $y = f'(x)$ funksiyaning grafigi tasvirlangan. $y = f(x)$ funksiyaning $-3 < x \le 0$ oraliqdagi o'sish oralig'ini toping.



A) $(-3;-1)$ B) $(-3;0)$ C) $(-\infty;-3)$ D) $(-1;0)$

16. $y > 0$ bo'lsin. To'rtburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quydagicha berilgan: $A(1;0), B(1;y), C(8;y)$ va $D(10;0)$. To'rtburchak diagonallarining o'rtalari orasidagi masofani toping.

A) 1 B) 2 C) $\sqrt{2}$ D) *y ga bog'liq*

17. Agar $f(x) = 13^x \cdot 3x$ bo'lsa, $f'(x) > 0$ tengsizlikni yeching.

A) $(-\log_{13} e\,; \infty)$ B) $(-\log_{13} e\,; e)$

C) $(-2\log_{13} e\,; \infty)$ D) $(-\infty; -\log_{13} e)$

18. $\sqrt{x+3} > x+1$ tengsizlikning butun musbat yechimlari nechta?

A) 2 B) 3 C) 5 D) *butun musbat yechimga ega emas*

19. $x = -y, z = 3$ bo'lsa, $\frac{x^3+y^3+z^3-3xyz}{x^2+y^2+z^2-xy-yz-xz}$ ifodaning qiymatini toping.

A) -3 B) 0 C) 3 D) 1

20. Asoslarining radiuslari 2 va 5 ga teng bo'lgan kesik konus va unga tengdosh silindrning balandliklari bir xil. Silindr asosining radiusini toping.

A) $\sqrt{13\frac{2}{3}}$ B) $\sqrt{29}$ C) $\sqrt{13}$ D) 7

21. $\alpha+\beta+\gamma = \pi$, $\cos\frac{\alpha}{2}\cos\frac{\beta}{2}\cos\frac{\gamma}{2} = \frac{1}{4}$ bo'lsa, $\sin\alpha + \sin\beta + \sin\gamma$ ning qiymatini toping.

A) 2 B) $\sqrt{2}$ C) $\sqrt{2+\sqrt{2}}$ D) 1

22. Agar barcha x, y lar uchun

$$x^3 + 4x^2y + axy^2 + 3xy - bx^cy + 7xy^2 + dxy + y^2 = x^3 + y^2$$

ayniyat bajarilsa, $a - b + c + d$ ni toping. $(c > 1)$

A) -10 B) -12 C) -16 D) 4

23. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quyidagicha berilgan: $A(0;0), B(-1;-2), C(-2;0)$. Uchburchak yuzini toping.

A) $2\sqrt{2}$ B) $2\sqrt{3}$ C) 2 D) 3

24. Ifodani soddalashtiring:

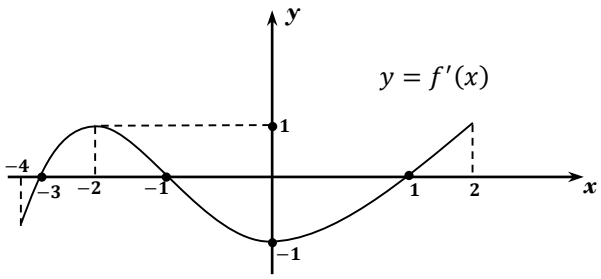
$$\cos^4 4\alpha + \sin 8\alpha - \sin^4 4\alpha$$

A) $\sqrt{2}\cos(8\alpha - 45°)$ B) $-\sqrt{2}\cos(4\alpha - 45°)$

C) $\sqrt{2}\sin(4\alpha - 45°)$ D) $\sqrt{2}\sin(8\alpha - 45°)$

25. Rasmda $y = f(x)$ funksiya grafigi berilgan. $y = f(x)$ funksiya ekstremum nuqtalari koordinatalari yig'indisini toping. $(x \in [-3;1])$

A) -3 B) -2 C) -1 D) -5



26. Hisoblang: $\log_2\left(\frac{1}{5\sqrt{2}-7} - \frac{10}{\sqrt{2}} + 7\right)$

A) 0 B) 7 C) $\log_2\frac{7\sqrt{2}}{2}$ D) $\log_2 14$

27. Funksiyaning qiymatlar sohasiga tegishli tub sonlar nechta?

$$y = 4\sin^2 2x + 4\sqrt{3}\sin x\cos x + 1{,}5\cos 4x + 1{,}5 - 2\sqrt{3}$$

A) 1 *ta* B) 0 *ta* C) 3 *ta* D) 2 *ta*

28. Teng yonli ABC uchburchakning AC asosida D nuqta shunday olinganki, AD=21, DC=23 tengliklar bajariladi. ABD va DBC uchburchaklarga ichki chizilgan aylanalar BD to'g'ri chiziqqa mos ravishda M va N nuqtalarda urinadilar. MN kesma uzunligini toping.

A) $\sqrt{3}$ B) 2 C) $\sqrt{2}$ D) 4

29. 4434 va 4435 sonlarining umumiy natural bo'luvchilari nechta?

A) 2 B) 0 C) 1 D) 3

30. Tenglamani yeching:

$$\left(1-\frac{1}{x}\right)\cdot\left(1-\frac{1}{x-1}\right)\cdot\left(1-\frac{1}{x-2}\right)\cdot\ldots\cdot\left(1-\frac{1}{3}\right)\cdot\left(1-\frac{1}{2}\right)=\frac{1}{2016}$$

A) 2016 B) 2015 C) 2014 D) 2013

MATEMATIKA

2016.7.

1. Tenglamani yeching: $2^{x-2}+2^{x-3}+2^{x-4}=224$

A) 7 B) 10 C) 11 D) 9

2. O'zaro teng bo'lmagan x va y sonlari $x^2+24y=y^2+24x$ tenglikni qanoatlantirsa, $x+y$ ni toping.

A) 24 B) 12 C) 0 D) 34

3. a va b natural sonlarning eng katta umumiy bo'luvchisi 6 ga teng bo'lsa, $a+3b$ va b sonlarning eng katta umumiy bo'luvchisi nimaga teng.

A) 1 B) 6 C) 4 D) *bir qiymatli aniqlab bo'lmaydi*

4. $2\sqrt{1-x^2}=x-2$ tenglamani yeching.

A) $\frac{4}{5}$ B) 0 C) $\emptyset$ D) 0; $\frac{4}{5}$

5. Poyezd 2 minutda 5 kilometr masofani, motosikl 3 minutda 4 kilometr masofani bosib o'tadi. Motosiklchining tezligi poyezd tezligining necha foizini tashkil etadi?

A) $67\frac{2}{3}\%$ B) $53\frac{1}{3}\%$ C) $66\frac{2}{3}\%$ D) 70%

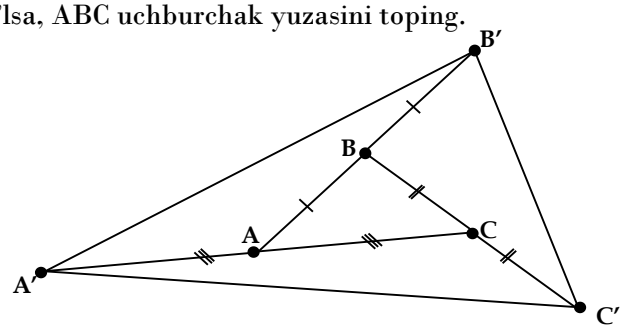
6. 60° ga teng bo'lgan A burchakka aylana ichki chizilgan. Bu aylana burchak tomonlariga B va C nuqtalarda urinadi. Agar $BC=3$ bo'lsa, $AB+AC$ ni toping.

A) 6 B) 3 C) *bir qiymatli aniqlab bo'lmaydi* D) 4

7. $\dfrac{\frac{1}{\sqrt{a}+\sqrt{b}}+\frac{1}{\sqrt{a}-\sqrt{b}}}{\frac{1}{\sqrt{a}-\sqrt{b}}-\frac{\sqrt{b}}{a-b}}$ ni soddalashtiring. $(a>0, b>0, a\neq b)$

A) $2a$ B) -2 C) 2 D) $-2a$

8. ABC uchburchakning har bir tomoni chizmada ko'satilgandek o'z uzunligiga teng uzunlikda davom ettirilgan. Agar A'B'C' uchburchak yuzasi 28 teng bo'lsa, ABC uchburchak yuzasini toping.



A) 2 B) 5 C) 3 D) 4

9. Tenglamalar sistemasini yeching va $x+y+z$ ni toping.

$$\begin{cases}2x-y+2z=7\\2x+5y-z=11\\4x-3y+z=7\end{cases}$$

A) 1 B) 5 C) 3 D) 4

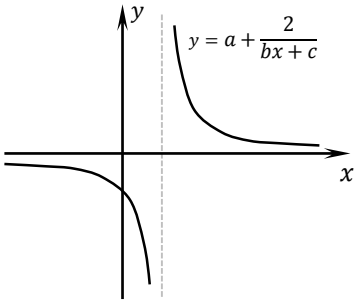
10. 3234 va 3235 sonlarning umumiy natural bo'luvchilari nechta?

A) 4 B) 2 C) 0 D) 1

11. Prizmaning qirralari soni 72 ga teng. Uning yoqlari sonini toping.

A) 26 B) 72 C) 24 D) *bir qiymatli aniqlab bo'lmaydi*

12. Rasmda $y=a+\frac{2}{bx+c}$ funksiya grafigi tasvirlangan. quyidagilardan qaysi biri doim o'rinli.



A) $ac^3 + b > 0$ B) $c^3 - b^3 > 0$ C) $abc > 0$ D) $bc > 0$

13. Hisoblang:

$$(1 + \text{tg}7°)(1 + \text{tg}8°)(1 + \text{tg}37°)(1 + \text{tg}38°)$$

A) 8 B) 16 C) 2 D) 4

14. $(0{,}2)^{\frac{1}{2}\log_5 4 - \log_{25} 16}$ ni hisoblang.

A) $\sqrt{2}$ B) 4 C) 2 D) 8

15. $y = 3\cos^2 x + \sin^2 x$ funksiya nechta butun qiymatni qabul qiladi?

A) *cheksiz ko'p* B) 3 C) 0 D) 2

16. Muntazam uchburchakli piramida asosining tomonidan unga ayqash yon qirraga perpendikulyar bo'lgan tekislik o'tkazilgan. Kesuvchi tekislik yon qirrani uchidan hisoblaganda 3:2 nisbatda kesadi. Asos tomoni $6\sqrt{2}$ ga teng bo'lsa, piramida yon sirtining yuzini toping.

A) 54 B) 72 C) 90 D) 108

17. ABCD trapetsiyaning AD va BC asoslari mos ravishda 9 va 5 ga teng. Agar ACD uchburchakning yuzi 18 ga teng bo'lsa, berilgan trapetsiyaning yuzini toping.

A) 22 B) 28 C) 24 D) 32

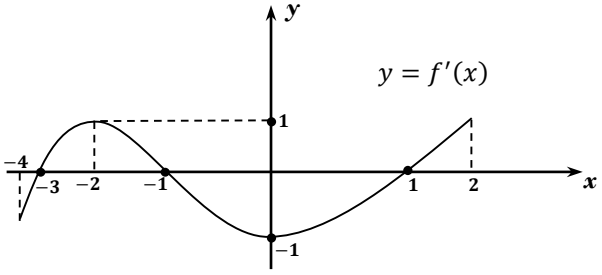
18. $\{x | x \in N, 2 \le x^2 \le 34\}$ to'plamni nechta bo'sh bo'lmagan qism – to'plami mavjud?

A) 15 B) 16 C) 34 D) 5

19. $y = \frac{1}{\sqrt{x}}; y = 0; x = 1; x = 4$ chiziqlar bilan chegaralangan shaklning yuzini toping.

A) 8 B) 0,5 C) 4 D) 2

20. Rasmda $y = f'(x)$ funksiya grafigi berilgan. $y = f(x)$ funksiya ekstremum nuqtalari absissalari o'rta arifmetigini toping. $x \in [-3; 1]$



A) -2 B) $-0{,}5$ C) -1 D) $-1{,}5$

21. Bir odam shunday vasiyat qildi: Naqd n dirham pulim bor. Bir kishiga qarz ham berganman. Qarzning miqdori o'g'lim oladigan merosga teng. Ikkala o'g'lim barobar meros olishsin. Ukamga jami merosning $1/5$ qismini va yana 1 dirham beringlar. Ul kishining o'g'illari necha dirhamdan meros olishgan.

A) $\frac{4n-5}{6}$ B) $\frac{4n+3}{6}$ C) $n - 4$ D) $\frac{2n+5}{3}$

22. $y = f(x)$ funksiya grafigi berilgan bo'lib, uni parallel ko'chirish yordamida $y = f(x + a) - b$ funksiya grafigi hosil qilingan. Bunday parallel ko'chirishda koordinata boshi qaysi nuqtaga ko'chadi?

A) $N(-a; b)$ B) $N(a; -b)$

C) $N(a; b)$ D) $N(-a; -b)$

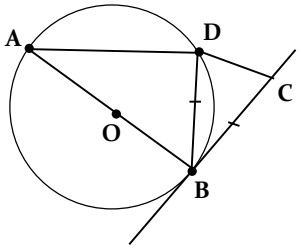
23. $a_1, a_2, \dots, a_8$ ketma – ketlikda ixtiyoriy uchta ketma – ket hadining yig'indisi 40 ga teng. Agar ketma – ketlikning uchinchi hadi 6 ga teng bo'lsa, birinchi va sakkizinchi hadlarining yig'indisi nechaga teng.

A) 6 B) 34 C) 12 D) 36

24. $x^8 - 18x^4 + 32 \le 0$ tengsizlikning barcha butun yechimlari ko'paytmasini toping.

A) 4 B) 2 C) -4 D) -2

25. Rasmga ko'ra $\angle BAD = 40°, BD = BC$ bo'lsa, $\angle DCB$ ni toping.



A) 40° B) 50° C) 80° D) 70°

26. $y = 3 + (a-1)x + ax^2$ parabolaning uchi y o'qi ustida bo'lsa, a ni toping.

A) 1 B) 3 C) 2 D) 0

27. Qaysi jismlarning simmetriya o'qlari chekli sonda?

1) shar; 2) prizma; 3) konus

A) 3 B) 1 C) 2, 3 D) 2

28. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quyidagicha berilgan: $A(0;0), B(1;1), C(2;0)$. Uchburchakning yuzini toping.

A) 1 B) 2 C) $\sqrt{3}$ D) $\sqrt{2}$

29. $|x^2 - 4ax| = a$ tenglama uchta haqiqiy yechimga ega bo'ladigan a ning barcha qiymatlari yig'indisini toping.

A) $\frac{1}{4}$ B) -1 C) 1 D) 0

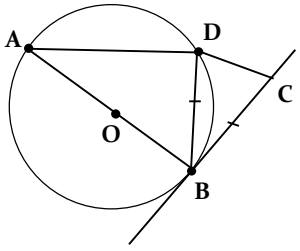
30. $a = 3$ bo'lsa, $\int_a^{a+1} \left(\ln\left(\sin^2 3x + \cos^2 3x\right) + 1\right) dx$ aniq integralni hisoblang.

A) 1 B) $\frac{\ln 2 - 1}{3}$ C) $2\sqrt{2}$ D) $\sqrt{2}$

MATEMATIKA

2016.8.

1. Rasmga ko'ra $\angle BAD = 40°, BD = BC$ bo'lsa, $\angle DCB$ ni toping.



A) 80° B) 70° C) 40° D) 50°

2. 2 va 162 sonlari orasiga shunday 3 ta son qo'yildiki, ular birgalikda ishorasi almashinuvchi geometrik progressiyani tashkil qildi. Oraga qo'yilgan sonlar yig'indisini toping.

A) 78 B) 0 C) 42 D) -42

3. $-b^{\frac{1}{3}} + \frac{a^{-\frac{4}{3}}b^{-2} - a^{-2}b^{-\frac{4}{3}}}{a^{-\frac{5}{3}}b^{-2} - a^{-2}b^{-\frac{5}{3}}} + a^{\frac{1}{3}}$ ni soddalashtiring. $(a \neq b; a \cdot b \cdot (a-b) \neq 0)$

A) 1 B) $a^{\frac{1}{3}} - b^{\frac{1}{3}}$ C) $a^{\frac{1}{3}} + b^{\frac{1}{3}}$ D) $2a^{\frac{1}{3}}$

4. $\left(1+\frac{2}{3}\right)\left(1+\frac{2}{4}\right)\left(1+\frac{2}{5}\right)\ldots\left(1+\frac{2}{98}\right)$ ni hisoblang.

A) 1 B) 980 C) 625 D) 825

5. $y = f(x)$ funksiya grafigi berilgan bo'lib, uni parallel ko'chirish yordamida $y = f(x-a) + b$ funksiya grafigi hosil qilingan. Bunday parallel ko'chirishda koordinata boshi qaysi nuqtaga ko'chadi?

A) $N(-a;b)$ B) $N(-a;-b)$

C) $N(a;b)$ D) $N(a;-b)$

6. Hisoblang: $\frac{1}{\log_3 9} + \frac{1}{\log_9 9} + \frac{1}{\log_{27} 9} + \frac{1}{\log_{81} 9} + \frac{1}{\log_{243} 9} + \frac{1}{\log_{729} 9} + \frac{1}{\log_{2187} 9}$.

A) 15 B) 13 C) 12 D) 14

7. $|x+4| = \frac{x}{2} + a$ tenglama a parametrning nechta natural qiymatida yechimga ega emas?

A) 0 B) 3 C) 2 D) 1

8. $\{x | x \in N, 2 \leq x^2 \leq 29\}$ to'plamni nechta usul bilan ikkita kesishmaydigan qism – to'plamlarga ajratish mumkin?

A) 29 B) 8 C) 12 D) 1

9. Uchta brigadada jami 2580 ta ishchi ishlaydi. Birinchi brigadada ikkinchisiga qaraganda 177 ta ishchi ko'p ishlaydi. Uchinchi brigadada ikkinchisiga qarganda 2,5 marta ko'p ishchi ishlaydi. Har bir brigada qanchadan ishchi ishlaydi?

A) 720; 530; 1330 B) 705; 535; 1340

C) 711; 534; 1335 D) 700; 550; 1330

10. $2\sqrt{2}$ radiusli sferaga muntazam to'rtburchakli piramida ichki chizilgan. Uchidagi yassi burchagi $45°$ ga teng bo'lsa, piramida yon sirtining yuzini toping.

A) 36 B) 32 C) 28 D) $16\sqrt{2}$

11. $[200;700]$ kesmada 2, 3, 5 va 7 sonlariga bo'linganda qoldiq 1 ga teng bo'ladigan natural sonlar nechta?

A) 1 B) 3 C) 2 D) 4

12. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quyidagicha berilgan: $A(0;0), B(1;1), C(2;0)$. Uchburchak yuzini toping.

A) $\sqrt{3}$ B) 1 C) $\sqrt{2}$ D) 2

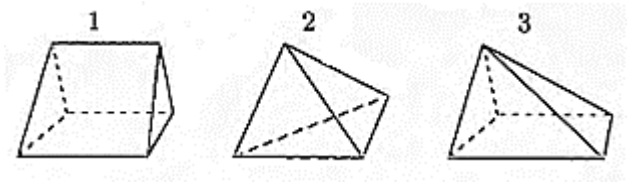
13. a ning qanday qiymatida $y = x^2 - 2x + 2$ funksiyaning qiymatlar sohasi bilan $y = \sqrt{2x - 4a}$ funksiyaning aniqlanish ustma – ust tushadi?

A) 2 B) 1 C) 0,5 D) 4

14. To'g'ri burcchakli uchburchakning perimetri 24 *dm*, yuzi 24 dm^2 ga teng. uchburchakning katetlari (*dm*) uzunligini toping.

A) 6 va 8 B) 6 va 7 C) 4 va 6 D) 7 va 8

15. Quyidagi ko'pyoqlardan qaysi birida 6 ta qirra bor?



A) 2 B) 1,3 C) 1 D) 3

16. Agar $x^2 + 36y^2 = 13xy$ bo'lsa, $\frac{x}{y}$ nisbatning eng katta qiymatini toping.

A) 4 B) 5 C) 9 D) 13

17. $\frac{x+6}{x(x-7)} - \frac{4}{(7-x)^2} = \frac{1}{x-7}$ tenglamani yeching.

A) 21 B) 2,1 C) 42 D) 4,2

18. $a = -b, c = -2$ bo'lsa,

$$\frac{c(a-b)^3 + a(b-c)^3 + b(c-a)^3}{c^2(b-a) + b^2(a-c) + a^2(c-b)}$$

ifodaning qiymatini toping.

A) 2 B) 0 C) 1 D) -2

19. $f(x) = |6 - 5x + x^2|$ funksiyaning $[-1;6]$ kesmadagi qiymatlar to'plamini toping.

A) $[0;12]$ B) $(0;12)$ C) $[0;+\infty)$ D) $[0;12)$

20. Ifodaning eng kichik qiymatini toping:

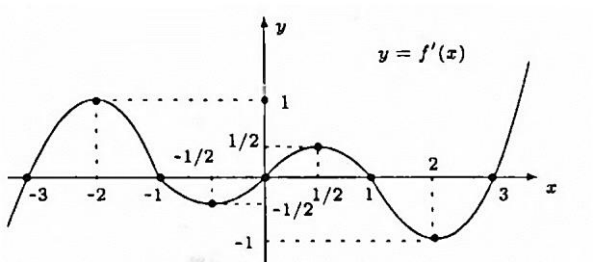
$$\frac{1}{8}\cos 4\alpha + \sin^2 2\alpha.$$

A) 0,125 B) 0,5 C) $-0,125$ D) 0,875

21. $a_1, a_2, \dots, a_8$ ketma – ketlikda ixtiyoriy uchta ketma – ket hadining yig'indisi 40 ga teng. agar ketma – ketlikning uchinchi hadi 9 ga teng bo'lsa, birinchi va sakkizinchi hadlarining yig'indisi nechaga teng.

A) 31 B) 9 C) 33 D) 18

22. Rasmda $y = f'(x)$ funksiyaning grafigi tasvirlangan. $[-3;3]$ kemadagi $y = f(x)$ funksiyaning nechta maksimum nuqtasi bor?



A) 1 B) 2 C) -1 D) 3

23. Agar barcha x va y lar uchun $x^3 + 4x^2y + axy^2 + 3xy - bx^cy + 7xy^2 + dxy + y^2 = x^3 + y^2$ ayniyat bajarilsa, $|a+b+c|(a+b)$ ni toping.$(c > 1)$

A) -3 B) 2 C) -1 D) -2

24. To'g'ri tenglikni aniqlang:

A) $\left(\log_5\left(5\sin^2\frac{4\pi}{11} + 5\sin^2\frac{3\pi}{22}\right) - 1\right)^0 = 1$

B) $\left(\sqrt{x-2}\right)^2 = |x-2|$

C) $(-2)^{\frac{1}{3}} = \sqrt[3]{2}$

D) $\frac{4(n^2-n-2)}{5(2-n)} = -\frac{4}{5}(n+1), n \neq 2$

25. Teng yonli uchburchakning yon tomoniga o'tkazilgan mediana va asosi orasidagi burchak tangensi 4 ga teng. Uchburchakning asosidagi burchak tangensini toping.

A) 15 B) $2\sqrt{2}$ C) 16 D) 12

26. Ushbu $f(x) = \frac{x+3}{x+4}$ funksiyaning boshlang'ich funksiyasini toping.

A) $x + 4\ln|x+4| + C$ B) $\frac{2x^2}{(x+4)^2} + C$

C) $x - \ln|x+4| + C$ D) $\ln(x+4)^2 + C$

27. $\frac{(x-4)(x+2)^2(x-8)}{(x+1)(x-7)} \leq 0$ tengsizlikni yeching.

A) $(-1;4) \cup (7;8) \cup \{-2\}$ B) $(-1;4] \cup (7;8]$

C) $(-1;4] \cup (7;8] \cup \{-2\}$ D) $(-1;4) \cup (7;8)$

28. Parallepipedning asoslari tomoni 4 ga teng kvadratlardan, barcha yon yoqlari romblardan iborat. Yuqori asosining uchlaridan biri ostki asosining barcha uchlaridan baravar uzoqlikda joylashgan. Parallepipedning hajmini toping.

A) $8\sqrt{2}$ B) $32\sqrt{2}$ C) $16\sqrt{2}$ D) 8

29. Teng yonli trapetsiya diagonallari o'zaro perpendikulyar. Uning yuzi 4 ga teng bo'lsa, balandlikni toping.

A) bir qiymatli aniqlab bo'lmaydi B) 1 C) 2 D) 3

30. $x - \sqrt{x+3} - 27 = 0$ tenglamaning ildizlari ko'paytmasini toping.

A) 48 B) 33 C) 36 D) 55

MATEMATIKA

2016.9.

1. Agar $\alpha = 75°$ va $\beta = 90°$ bo'lsa, $\sin\alpha \cdot \sin(\beta - \alpha) + \sin^2\left(\frac{\beta}{2} - \alpha\right)$ ni hisoblang.

A) $\frac{1}{2}$ B) $\frac{2-\sqrt{3}}{4}$ C) $\frac{\sqrt{2}}{4}$ D) $\frac{1}{4}$

2. Agar $\log_{30} 90 = a$ bo'lsa, $\log_3 10$ ni toping.

A) $\frac{a+2}{a+1}$ B) $\frac{2-a}{a+1}$ C) $\frac{a-2}{a+1}$ D) $\frac{a-2}{1-a}$

3. Diagonallarining soni tomonlari sonidan 3 marta ko'p bo'lgan qavariq muntazam ko'pburchakning har bir uchidan bittadan olingan tashqi burchagi va bitta ichki burchagining yig'indisini toping.

A) 500° B) 504° C) 480° D) 496°

4. $\sqrt[3]{x^{\log_3 \sqrt[3]{x}}} > 3$ tengsizlikning yechimi bo'lmaydigan eng katta va eng kichik tub sonlar ayirmasini toping.

A) 21 B) 25 C) 26 D) 22

5*. SABC uchburchakli piramidaning S uchidagi yassi burchaklari to'g'ri burchak. SO – piramida balandligi. AOB va BOC uchburchaklar yuzalari mos ravishda 8 va 2 ga teng. ASB uchburchak yuzasining BSC ucburchak yuzasiga nisbatini toping.

A) 2 B) 3 C) *aniqlab bo'lmaydi* D) $\sqrt{2}$

6. $\sqrt{2x^3 - 5x^2 - 8x + 2} = \sqrt{2}(x-1)$ tenglama nechta butun yechimga ega?

A) 2 B) 1 C) 0 D) 3

7. $\frac{x+6}{x(x-7)} - \frac{4}{(7-x)^2} = \frac{1}{x-7}$ tenglamani yeching.

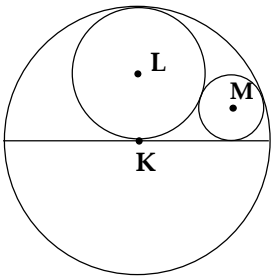
A) 21 B) 2,1 C) 42 D) 4,2

8. $\frac{0{,}25 \cdot 4{,}5^2 - 2{,}75^2}{\sqrt{1{,}5^2 - 3 \cdot 0{,}25 + 0{,}25^2}}$ ni hisoblang.

A) -2 B) 2 C) 4 D) 5

9. AB kesma K aylananing diametri bo'lsin. L aylana K aylanaga hamda AB to'g'ri chiziqqa K aylananing markazida urinadi; M aylana K va L aylanaga hamda AB to'g'ri chiziqqa urinadi (chizmaga qarang). Agar

M doira yuzasi 2 ga teng bo'lsa, L doira yuzasini toping.



A) *aniqlab bo'lmaydi* B) 12 C) 4 D) 8

10. $a = 2$ bo'lsa, $\int_a^{a+1}\left(\ln\left(\sin^2 3x+\cos^2 3x\right)+1\right)dx$ aniq integralni hisoblang.

A) $\frac{\ln 2-1}{3}$ B) 1 C) $2\sqrt{2}$ D) $\sqrt{2}$

11. Teng yonli uchburchakning yon tomoniga tushirilgan medianasi 5 *sm*, asosi $4\sqrt{2}$ *sm* bo'lsa, uchburchakning yon tomonini (*sm*) toping.

A) 7 B) 5 C) 6 D) $4\sqrt{2}$

12. $y = \text{arctg}\, x$ funksiya grafigi berilgan bo'lib, uni parallel ko'chirish yordamida $y = \text{arctg}\,(x + a) + b$ funksiya grafigi hosil qilingan. Bunday parallel ko'chirishda koordinata boshi qaysi nuqtaga ko'chadi?

A) $N(a;-b)$ B) $N(-a;b)$ C) $N(b;a)$ D) $N(a;b)$

13. Agar geometrik progressiyada $b_1 = -3$ va $b_n = -192; S_n = -381$ bo'lsa, n ni toping.

A) 7 B) 11 C) 5 D) 9

14. $\frac{(x-4)(x+2)^2(x-8)}{(x+1)(x-7)} \le 0$ tengsizlikni yeching.

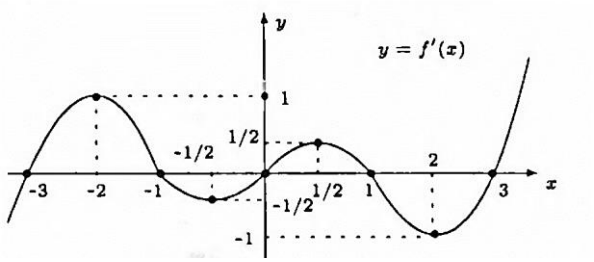
A) $(-1;4]\cup(7;8]$ B) $(-1;4]\cup(7;8]\cup\{-2\}$

C) $(-1;4)\cup(7;8)$ D) $(-1;4)\cup(7;8)\cup\{-2\}$

15. Uchburchaklning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quyidagicha berilgan: $A(0;0), B(-1;-2), C(-2;0)$. Uchburchak yuzini toping.

A) $2\sqrt{2}$ B) 3 C) 2 D) $2\sqrt{3}$

16. Rasmda $y = f'(x)$ funksiya grafigi tasvirlangan. $y = f(x)$ funksiya grafigiga $x_0 = 3$ absissali nuqtasiga o'tkazilgan urinmaning burchak koeffitsiyentini toping.



A) 1 B) -1 C) 3 D) 0

17. $y = \frac{x^2+6x+21}{11+6x+x^2}$ funksiyaning eng katta va eng kichik butun qiymatlari ko'paytmasini toping.

A) 12 B) 15 C) 6 D) 18

18. Asoslarining radiuslari 3 va 4 ga teng bo'lgan kesik konus va unga tengdosh silindrning balandliklari bir xil. Silindr asosining radiusini toping.

A) $\sqrt{12\frac{2}{3}}$ B) $\sqrt{17}$ C) $\sqrt{12\frac{1}{3}}$ D) $\sqrt{13}$

19. Quyidagi tenglamalar sistemasini yeching.

$$\begin{cases} EKUK(x;y) = 10 \\ xy = 20 \end{cases}$$

A) (5; 2) yoki (2; 5) B) (2; 10) yoki (10; 2)

C) (4; 5) yoki (5; 4) D) (1; 20) yoki (20; 1)

20. $\{x | x \in N, 2 \le x^2 \le 34\}$ to'plamning nechta qism – to'plamlari mavjud?

A) 32 B) 34 C) 16 D) 5

21. x ning qanday qiymatlarida $|44 + 2x^2 - 26x| = -(26x - 44 - 2x^2)$ tenglik o'rinli bo'ladi?

A) $(-\infty;-2)\cup(11;+\infty)$ B) $(2;11)$

C) $(-\infty;2]\cup[11;+\infty)$ D) $(-2;0)\cup(0;11)$

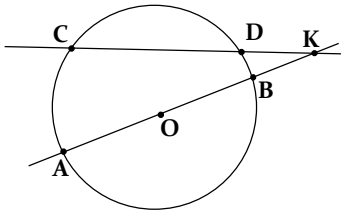
22. a ning qanday qiymatida $y = x^2 - 2x + 2$ funksiyaning qiymatlar sohasi bilan $y = \sqrt{2x - 4a}$ funksiyaning aniqlanish ustma – ust tushadi?

A) 4 B) 0,5 C) 1 D) 2

23. Agar barcha x va y lar uchun $x^3+4x^2y+axy^2+3xy-bx^cy+7xy^2+dxy+y^2=x^3+y^2$ ayniyat bajarilsa, $c+d$ ni toping.$(c>1)$

A) 3 B) -1 C) -4 D) -2

24. Rasmga qarab noto'g'ri tasdiqni aniqlang.



A) CD kesma uzunligi AB kesma uzunligidan katta

B) AB va CD to'g'ri chiziqlar keishish nuqtasi, markazi O nuqtada bo'lgan doira tashqarisida joylashgan

C) AB – aylana diametri

D) AB kesma uzunligi CD kesma uzunligidan katta

25. $a_1, a_2, \dots, a_8$ ketma – ketlikda ixtiyoriy uchta ketma – ket hadining yig'indisi 40 ga teng. Agar ketma – ketlikning uchinchi hadi 6 ga teng bo'lsa, birinchi va sakkizinchi hadlarining yig'indisi nechaga teng.

A) 34 B) 6 C) 36 D) 12

26. To'g'ri tenglikni aniqlang:

A) $\left(\sqrt{x-2}\right)^2=|x-2|$

B) $\left(\log_5\left(5\sin^2\frac{4\pi}{11}+5\sin^2\frac{3\pi}{22}\right)-1\right)^0=1$

C) $(-2)^{\frac{1}{3}}=\sqrt[3]{2}$

D) $\frac{4(n^2-n-2)}{5(2-n)}=-\frac{4}{5}(n+1), n\neq 2$

27. $\frac{m-4\sqrt{m-4}}{2}\cdot\frac{\sqrt[3]{m+4\sqrt{m-4}}\cdot\sqrt[3]{\sqrt{m-4}+2}}{\sqrt[3]{m-4\sqrt{m-4}}\cdot\sqrt[3]{\sqrt{m-4}-2}}$ ifodani soddalshtiring.$(m\geq 4, m\neq 8)$

A) $m-2$ B) $\frac{m}{2}+4$ C) $\frac{m}{2}-4$ D) $m+2$

28. O'zaro teng bo'lmagan x va y sonlari $x^2+36y=y^2+36x$ tenglikni qanoatlantirsa, $x+y$ ni toping.

A) 36 B) 0 C) 18 D) 24

29. Bir ayol bog'ga olma tergani kirdi. Bog'dan u 4 ta eshik orqali chiqishi kerak edi. Har bir eshik oldida qorovul turgan bo'lib, ayol birinchi qorovulga tergan olmalarining yarmini berdi. Ikkinchi qorovulga esa qolgan olmalarining yarmini berdi. Uchinchi va to'rtinchi qorovullarni ham xudi shunday siyladi. Oxirida o'zida 10 ta olma qoldi. Ayol bog'dan necha dona olma uzgan?

A) 160 B) 180 C) 210 D) 150

30. Uchburchakning uchlari to'g'ri burchakli dekart koorinatalar sistemasida quyidagicha berilgan: $A(1;0), B(6;0), C(1;5)$. O'tkir burchaklar medianalari orasidagi burchak kosinusini toping.

A) $-\frac{3}{5}$ B) $-\frac{4}{7}$ C) $-\frac{5}{7}$ D) $-\frac{4}{5}$

MATEMATIKA

2016.10.

1. $a=-2$ bo'lsa,

$$\int_a^{a+1}(\ln(\sin^2 3x+\cos^2 3x)+1)dx$$

aniq integralni hisoblang.

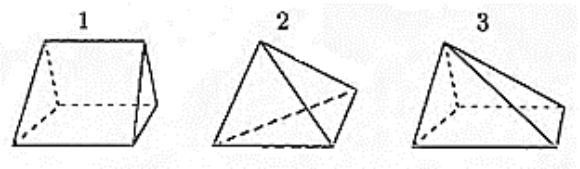
A) 1 B) $2\sqrt{2}$ C) $\frac{\ln 2-1}{2}$ D) $\sqrt{2}$

2. Agar barcha x, y lar uchun $x^3+4x^2y+axy^2+3xy-bx^cy+7xy^2+dxy+y^2=x^3+y^2$ ayniyat bo'lsa, $|a+b+c|(a-b-c-d)$ ni toping.$(c>1)$

3. $\{x: x\epsilon N, 2\leq x^2\leq 28\}$ toplamni necha usul bilan ikkita kesishmaydigan qism to'plamlarga ajratish mumkin?

A) 28 B) 8 C) 12 D) 16

4. Quydagi ko'pyoqlardan qaysi birida 5 ta yoq, 9 ta qirra va 6 ta uchi bor?



A) 1 B) 1, 3 C) 2 D)3

5. Nomanfiy x, y sonlar uchun $a = 9x + \frac{1}{9}y$ va $b = 2\sqrt{xy}$ bo'lsin. Qaysi tengsizlik har doim o'rinli?

A) $a \le b$ B) $a < b$ C) $a \ge b$ D) $a > b$

6. $y = \ln(6 + 2(sin^2 x - 3sin4x) + cos8x + cos2x)$ funksiyaning qiymatlar sohasini toping.

A) $[\ln 12; \infty)$ B) $(0; 12]$ C)$(-\infty; \ln 12]$ D)$[0; \ln 12)$

7. [0; 500] kesmada 3 ga bo'linganda qoldiq 1 ga, 4 ga bo'lganda 2 ga, 5ga bo'lganda 3 ga va 6 ga bo'lganda qoldiq 4 ga teng bo'ladigan natural sonlar nechta?

A) 6 B) 8 C) 5 D) 7

8. Agar $\log_{30} 90 = a$ bo'lsa, lg3 ni a orqali ifodalang.

A) $\frac{a+1}{a+2}$ B) $\frac{a+1}{2-a}$ C) $\frac{a+1}{a-2}$ D) $\frac{1-a}{a-2}$

9. $x = -y, z = -2$ bo'lsa, $\frac{x^3+y^8+z^3-3xyz}{x^2+y^2+z^2-xy-xz-yz}$ ifodaning qiymatini toping?

A) 2 B) -2 C) 1 D) 0

10. $y = 7\sin 5x + 5\cos 7x$ funksiyaning hosilasini toping.

A) $-70\cos x\sin 6x$ B) $70\cos x\cos 6x$ C) $70\sin x\cos 6x$ D) $70\sin x\sin 6x$

11. $\frac{x-4}{x-5} + \frac{6x-30}{x-4} = 5$ tenglamani yeching.

A) 6,5; 6 B) $-5,5; -6$ C) 5,5; 6 D) $-5,5$; 6

12. $y = \ln(\text{arctg}3x + \text{arcctg}3x)$ funksiyaning $x = \frac{1}{2}$ nuqtadagi hosilasining qiymatini toping.

A) 0 B) 1 C) –ln2 D) ln2

13. Hisoblang:

$$(1 + \text{tg}37°)(1 + \text{tg}38°)(1 + \text{tg}7°)(1 + \text{tg}8°)$$

A) 2 B) 16 C) 4 D) 8

14. Ushbu $f(x) = \frac{2x+1}{x^2+x-12}$ funksiyaning boshlang'ich funksiyasini toping.

A) $\frac{2x^2}{(x-3)(x+4)} + C$ B) $\ln(x-3) + C$

C) $\ln|x+4| + C$ D) $\ln(|x-3||x+4|) + C$

15*. Qirrasi $\sqrt{3}$ ga teng bo'lgan kubning qo'shni yoqlarining ayqash dioganallari orasidagi masofani toping.

A) $\sqrt{2}$ B) 1 C) $\sqrt{3}$ D) 3

16. $\log_{x+1} 7 > \log_{x+1} 11$ tengsizlikni yeching.

A) $(-1;0)$ B) $(-1;1)$ C) $(0;1)$ D) $(-2;-1)$

17. Parallelopipedning asoslari tomoni 6 gateng kvadratdan, barcha yon yoqlari rombdan iborat. Yuqori asosing uchidan biri ostki asosining barcha uchlaridan bir xil uzoqlikda joylashgan. Parallelopiped hajmini toping.

A) $54\sqrt{2}$ B) $72\sqrt{2}$ C) $108\sqrt{2}$ D) 81

18. $f(x) = \frac{x}{x+1}$ funksiyaning grafigi qaysi choraklardan o'tadi.

A) I, II, III B) I, II, III, IV C) I, II D) I, III

19. $a_1, a_2, \dots, a_8$ ketma- ketlikda ixtiyoriy uchta ketma – ket hadining yigindisi 40 ga teng. Agar ketma-ketlikning uchinchi hadi 9 ga teng bo'lsa, birinchi va sakkizinchi hadlari yigindisi nechaga teng?

A) 33 B) 31 C) 19 D) 9

20. $y > 0$ bo'lsin. To'rtburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quydagicha berilgan: $A(1;0), B(1;y), C(2;y), D(4;0)$. To'rtburchak dioganallari o'rtalari orasidagi masofani toping.

A) 1 B) $\sqrt{2}$ C) *y ga bog'liq* D) 2

21. Teng yonli trapetsiyaning yon tomoni 8 ga, dioganali o'rta chizig'ini 2 va 4 ga teng kesmalarga ajratadi. Trapetsiyaning yuzini toping.

A) 36 B) $12\sqrt{6}$ C) $2\sqrt{15}$ D) 45

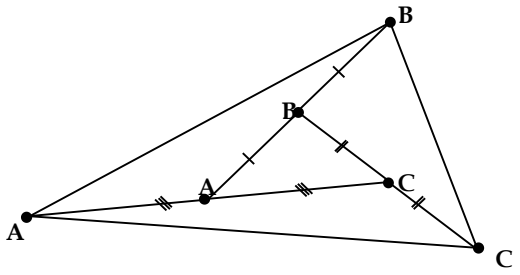
22. $x - \sqrt{2x} - 4 = 0$ tenglamaning haqiqiy ildizlari ko'paytmasini (Ildiz yagona bo'lsa o'zini) toping.

A) 16 B) 32 C) -8 D) 8

23. $\left|1 - \log_{\frac{1}{6}} x\right| + 2 = \left|3 - \log_{\frac{1}{6}} x\right|$ tenglamani yeching.

A) 6 B) 36 C) $\left[\frac{1}{6};\infty\right)$ D) $[6;\infty)$

24. ABC uchburchakning har bir tomoni chizmada ko'satilgandek o'z uzunligiga teng uzunlikda davom ettirilgan. Agar ABC uchburchak yuzasi 1 teng bo'lsa, A'B'C' uchburchak yuzasini toping.



A) 8 B) 7 C) 6 D) 5

25. Radiuslari 2 *sm* va 6 *sm* bo'lgan aylanalar tashqi urinadi. Tashqi urinish nuqtasidan umumiy urinmasigacha bo'lgan masofani (*sm*) toping.

A) 3,5 B) 2,5 C) 2 D) 3

26. $D_1(f)$ to'plamda $f(x)$ va $D_2(g)$ to'plamda $g(x)$ funksiyalar berilgan bo'lsin, bunda $D_1(f) \cap D_2(g) \neq \emptyset$. Quyidagi qaysi sohada $f(x)$ va $g(x)$ funksiyalar bo'linmasi $F(x) = \frac{f(x)}{g(x)}$ aniqlangan bo'ladi.

A) $g(x)$ 0 ga aylanmaydigan x larni o'z ichiga olmagan $D_1(f) \cup D_2(g)$ sohada.

B) $g(x)$ 0 ga aylanmaydigan x larni o'z ichiga olmagan $D_1(f) \cap D_2(g)$ sohada.

C) $F(x)$ 0 ga aylanmaydigan x larni o'z ichiga olmagan $D_1(f) \cap D_2(g)$ sohada.

D) $F(x)$ 0 ga aylanmaydigan x larni o'z ichiga olmagan $D_1(f) \cup D_2(g)$ sohada

27. $5 \cdot 0{,}2^{\lg x} > 0{,}04^{\lg 2}$ tengsizlikni qanoatlantruvchi eng katta va eng kichik natural sonlar ko'paytmasini toping.

A) 39 B) 40 C) 41 D) 38

28. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quydagicha berilgan: A(0;0), $B\left(-\frac{1}{2};8\right)$, $C(-1;0)$. Uchburchak yuzini topimg.

A) $3\sqrt{2}$ B) $2\sqrt{3}$ C) 4 D) 3

29. $7^{\sin^2 x} + 7^{\cos^2 x} = 8$ tenglamaning $[0;2\pi]$ kesmadagi ildizlari yig'indisini toping.

A) 360° B) 270° C) 630° D) 900°

30. Hisoblang: $\operatorname{ctg}^2\left(\arcsin\frac{1}{7}\right) - 15$

A) 36 B) -24 C) 33 B) 17

MATEMATIKA

2016.11.

1. 60° ga teng bo'lgan A burchakka aylana ichki chizilgan. Bu aylana burchak tomonlariga B va C nuqtalarda urinadi. Agar BC =1 bo'lsa, AB ni toping.

A)3 B) *bir qiymatli aniqlab bo'lmaydi* C) 2 D) 1

2. To'g'ri burchakli trapetsiyaning asoslari 2 va 6 ga teng. Unga ichki chizilgan aylana radiusini toping.

A) 1,6 B) 1,2 C) 1,5 D) 1,1

3. $(0{,}2)^{\frac{1}{2}\log_5\sqrt{2}-\log_{25}2}$ sondan katta bo'lmagan natural sonlar nechta?

A) 3 B) 2 C) 0 D) 1

4. Agar $a > 3$, $b > 5$ bo'lsa, quyidagilardan qaysilari doimo o'rinli?

1) $2a + 3b > 21$
2) $2a + 3b > 36 - ab$
3) $(a+b)^2 > 36$
4) $2a^2 + 3b^2 > 94$
5) $3a + 2b > 19$

A) 3,4,5 B) 2,3,5 C) 1,2,5 B) 1,2,4

5. Agar $\begin{cases} x^2 + (y+a)^2 - 1 = 0 \\ x^2 + y = b \end{cases}$ tenglamalar sistemasi yagona yechimga ega bo'lsa $a + b$ ni toping.

A) *bir qiymatli aniqlab bo'lmaydi* B) -1 C) 1 D) 0

6. Agar $f(x) = 13^x \cdot 3x$ bo'lsa, $f'(x) > 0$ tengsizlikni yeching.

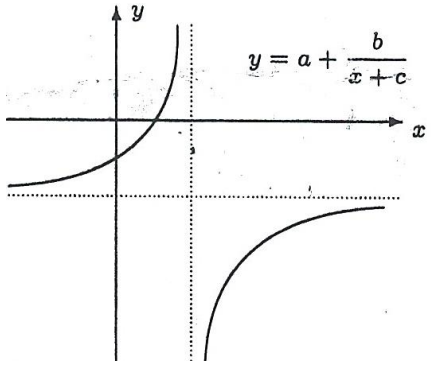
A) $(-\log_{13} e; e)$ B) $(-2\log_{13} e; \infty)$

C) $(-\log_{13} e; \infty)$ D) $(-\infty; -\log_{13} e)$

7. Prizmaning qirralari soni 78 ga teng. Uning yoqlari sonini toping.

A) 78 B) 28 C) 26 D) *bir qiymatli aniqlab bo'lmaydi*

8. Rasmda $y = a + \frac{b}{x+c}$ funksiya grafigi tasvirlangan. Quydagilardan qaysi biri noto'g'ri?



A) $a^4 + b < 0$ B) $b^3 + a < 0$ C) $b^3 - a^3 < 0$

D) $ac^2 - b^4 < 0$

9. $a_1, a_2, \dots, a_8$ ketma- ketlikda ixtiyoriy uchta ketma – ket hadining yigindisi 50 ga teng. Agar ketma-ketlikning uchinchi hadi 6 ga teng bo'lsa, birinchi va sakkizinchi hadlari yigindisi nechaga teng?

A) 12 B) 48 C) 6 D) 44

10. a sonining oxirgi raqami 1 ga va bu sonning 10 ta natural bo'luvchilari bo'lsa, $10a$ sonining nechta natural bo'luvchisi bor? (1 va a ham kiradi)

A) 30 B) 50 C) 40 D) 20

11. $y = x^3$; $y = 0$; $x = -3$; $x = 1$ chiziqlar bilan chegaralangan shaklning yuzini toping.

A) 10,75 B) 21 C) 20,5 D) 24

12. $\{x: x\epsilon N, 2 \le x^2 \le 31\}$ to'plamni necha usul bilan ikkita kesishmaydigan qism to'plamlarga ajratish mumkin?

A) 12 B) 16 C) 8 D) 31

13. To'g'ri tenglikni toping.

A) $\left(\log_2 \frac{1}{256}\right)^{\frac{1}{3}} = 2$

B) $\sqrt[3]{5^3 \cos 3\pi} = -5$

C) $\left(\left(4\sin^2\frac{7\pi}{9} + 4\sin^2\frac{5\pi}{18}\right) + \log_2\frac{1}{16}\right)^{\log_2\frac{1}{2}} = \frac{1}{4\sin^2\frac{7\pi}{9} + 4\sin^2\frac{5\pi}{18} + \log_2\frac{1}{16}}$

D) $\frac{4(x-2)}{5(x-2)} = \frac{4}{5}, x \in \mathbb{R}$

14. $y = \text{arctg}x$ funksiyaning grafigi berilgan bo'lib, uni parallel ko'chirish yordamida $y = \text{arctg}(x-a) - b$ funksiya grafigi hosil qilingan. Bunday parallel ko'chirishda koordinata boshi qanday nuqtaga ko'chadi.

A) $N(a;-b)$ B) $N(b;a)$ C) $N(-a;b)$ D) $N(a;b)$

15. $\sqrt{x^2 - 6x} < 2x + 8$ tengsizlikni qanoatlantirmaydigan musbat butun yechimlar nechta?

A) *cheksiz ko'p* B) 5 C) 6 D) 4

16. Ifodaning eng katta qiymatini toping:

$$\frac{1}{4}\cos 2a + \sin^2 a$$

A) 0,75 B) 1,25 C) 1 D) 0,5

17. $2^{\sqrt{x+1}} \cdot 64 = 4^{\sqrt{x+1}}$ tenglamani yeching.

A) 15 B) 24 C) 48 D) 35

18. Teng yonli ABC uchburchakning AC asosida D nuqta shunday olinganki AD=13, DC=15 tengliklar bajariladi. ABD va DBC uchburchaklarga ichki chizilgan aylanalar BD to'g'ri chiziqqa mos ravishda M va N nuqtalarda urinadilar. MN kesma uzunligini toping.

A) 1 B) 2 C) $\sqrt{3}$ D) $\sqrt{2}$

19. $\left|3 - \sqrt{x+5}\right| > \frac{x-8}{6}$ tengsizlikning butun yechimlari nechta?

A) 23 B) *cheksiz ko'p* C) 24 D) 25

20. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quydagicha berilgan: $A(0;0), B\left(-\frac{1}{2};-10\right), C(-1;0)$. Uchburchak yuzini toping

A) 5 B) $3\sqrt{3}$ C) $4\sqrt{2}$ D) 4

21. $\sqrt{3}$ radiusli sferaga muntazam to'rtburchakli pramida ichki chizilgan. Uchidagi yassi burchak 45° ga teng bo'lsa, piramida yon sirtining yuzini toping.

A) 15 B) 12 C) 14 D) $9\sqrt{2}$

22. $a = -5$ bo'lsa,

$$\int_{a}^{a+1} (\ln(\sin^2 3x + \cos^2 3x) + 1)dx$$

aniq integralni hisoblang.

A) 1 B) $2\sqrt{2}$ C) $\frac{\ln 2-1}{2}$ D) $\sqrt{2}$

24. $y = \frac{|x+1|}{x-1}$ funksiyaning qiymatlar sohasini toping.

A) $(-\infty; 0] \cup (1; \infty)$ B) $(-1; 1]$

C) $(-\infty; -1] \cup (1; \infty)$ D) $[-1; 1]$

25. $\frac{c(a-b)^3+a(b-c)^3+b(c-a)^3}{c^2(b-a)+a^2(c-b)+b^2(a-c)}$ ifodani soddalashtring.

A) $a+b-c$ B) $a+b+c$ C) $a-b-c$
D) $a-b+c$

26. Kichkina koala daraxt shoxlarini 10 soatda yeb tugatadi, otasi ham, onasi ham undan ikki marta tez yeydi. Ular bitta daraxtni necha soatda yeb tugatadi?

A) 2 B) 3 C) 4 D) 5

27. Qaysi jism(lar)ning simmetriya tekisliklari chekli sonda?

1) kub 2) prizma 3) konus

A) 1;2 B) 3 C) 2 D) 1;3

28. $\frac{\sin 10a+\sin 6a+\sin 2a}{\cos 10a+\cos 6a+\cos 2a}$ ni soddalashtring.

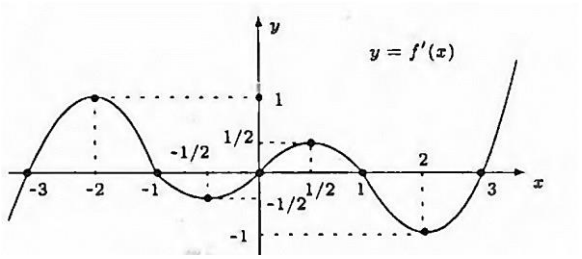
A) $\sin 10a$ B) 2 C) $\cos 2a$ D) $\mathrm{tg}6a$

29. Tenglamaning nechta ildizi bor?

$$\sqrt{2x+15} - 42 = 2x - 39$$

A) 2 *ta* B) 1 *ta* C) *ildizga ega emas* D)3 ta

30. Rasmda $y = f'(x)$ funksiya grafigi tasvirlangan. $y = f(x)$ funksiya grafigiga $x_0 = 3$ abssisali nuqtasiga o'tkazilgan urinmaning burchak koeffitsentini toping.



A) -1 B) 3 C) 0 D) 1

MATEMATIKA

2016.12.

1. Katetlari $3 - 2\sqrt{2}x + x^2 = 0$ tenglama ildizlariga teng bo'lgan to'g'ri burchakli uchburchakning yuzini toping.

A) 5 B) 1,5 C) 4 D) 2

2. $1 \cdot 2 \cdot 3 \cdot \ldots \cdot 30$ ko'paytmani tub ko'paytuvchilarga ajratganda ko'paytmada $2^n, 3^m$ va 7^k lar ishtirok etsa, $n+m+k$ ni toping.

A) 46 B) 40 C) 50 D) 44

3. O'zaro teng bo'lmagan x va y sonlari $x^2 + 16y = y^2 + 16x$ tengloikni qanoatlantirsa, $x+y$ ni toping.

A) 26 B) 16 C) 24 D) 0

4. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalari sistemasida quyidagicha berilgan: $A(0;0), B(1;-3), C(2;0)$. Uchburchakning yuzini toping.

A) $2\sqrt{2}$ B) 2 C) 3 D) $2\sqrt{3}$

5. Samandarning o'g'il bola sinfdoshlari soni qiz bola sinfdoshlari sonidan 7 taga ko'p. Sinfda o'g'il bolalar soni qiz bolalar sonidan 2 marta ko'p. Diyora – Samandarning sinfdoshi. Diyoraning sinfdosh dugonalari nechta?

A) 7 B) 9 C) 8 D) 6

6. Tenglamani yeching: $2^{x-2} + 2^{x-3} + 2^{x-4} = 224$

A) 11 B) 7 C) 9 D) 10

7. $y = \frac{x^2+6x+21}{11+6x+x^2}$ funksiyaning eng katta va eng kichik butun qiymatlari yig'indisini toping.

A) 7 B) 8 C) 21 D) 20

8. Funksiyaning qiymatlar sohasiga tegishli nomusbat butun sonlar nechta?

$$y = \ln(6 + 2(\sin^2 x - 3\sin 4x) + \cos 8x + \cos 2x)$$

A) 3 *ta* B) 2 *ta* C) cheksiz ko'p D) 4 *ta*

9. $4^{4^x} = 2^{2^{3^{2^2}}}$ tenglamani yeching.

A) 40 B) 8 C) 4 D) 3

10. Teng yonli uchburchakning yon tomoniga o'tkazilgan mediana va asosi orasidagi burchakning tangensi 4 ga teng. Uchburchakning asosidagi burchak tangensini toping.

A) 15 B) $2\sqrt{2}$ C) 16 D) 12

11. a ning qanday qiymatida $y = x^2 - 2x + 2$ funksiyaning qiymatlar sohasi bilan $y = \sqrt{2x - 4a}$ funksiyaning aniqlanish ustma – ust tushadi?

A) 4 B) 0,5 C) 1 D) 2

12. Ifodaning eng kichik qiymatini toping:

$$\frac{1}{8}\cos 4\alpha + \sin^2 2\alpha$$

A) $-0{,}125$ B) 0,875 C) 0,125 D) 0,5

13. $\sqrt{2x^3 - 5x^2 - 8x + 2} = \sqrt{2}(x - 1)$ tenglama nechta butun yechimga ega?

A) 2 B) 0 C) 1 D) 3

14. $\frac{\sin 10\alpha + \sin 6\alpha + \sin 2\alpha}{\cos 10\alpha + \cos 6\alpha + \cos 2\alpha}$ ni soddalashtiring.

A) $\operatorname{tg} 6\alpha$ B) $\cos 2\alpha$ C) $\sin 10\alpha$ D) 2

15. ABCD tetraedrning D uchidagi barcha yassi burchaklar to'g'ri. Shu tetraedrdaga kub shunday ichki chizilganki, kubning bitta uchi D nuqtada, unga qarama – qarshi uchi esa ABC yoqda yotibdi. Agar $DA = 4, DB = 6, DC = 8$ bo'lsa, kub qirrasining uzunligini toping.

A) 13/12 B) 17/19 C) 24/13 D) $2\sqrt{2}$

16. ABCD parallelogrammning A va D uchlari $\mathcal{M}$ tekislikda, B va C uchlari uning tashqarisida. $AD = 10\ sm, AB = 15\ sm$, AC va BD diagonallarining $\mathcal{M}$ tekislikdagi proyeksiyalari mos ravishda $13{,}5\ sm$ va $10{,}5\ sm$ ga teng. Parallelogrammning diagonallarini toping.

A) 19 *sm*; 17 *sm* B) 20 *sm*; 16 *sm* C) 20 *sm*; 17 *sm* D) 19 *sm*; 18 *sm*

17. To'g'ri tenglikni aniqlang. $\left(a \in R, \frac{m}{n} \in Q\right)$

A) $\sqrt{(-a)^2} = a$ B) $\left(\sqrt{a}\right)^2 = |a|$

C) $(a^2 + 1)^{\frac{m}{n}} = \sqrt[n]{(a^2 + 1)^m}$

D) $(a^2 - 1)^{-1} = \frac{1}{a^2 - 1}$

18. $2\cos^2 x + 3\cos x > 0$ tengsizlikning $[0; 2\pi]$ kesmadagi yechimlari to'plamini toping.

A) $\left[0; \frac{\pi}{3}\right] \cup \left[\frac{3\pi}{2}; 2\pi\right]$ B) $[0; \pi]$ C) $\left(0; \frac{\pi}{2}\right)$

D) $\left[0; \frac{\pi}{2}\right) \cup \left(\frac{3\pi}{2}; 2\pi\right]$

19. C nuqta – AB kesmaning o'rtasi. AC va BC kesmalarda mos ravishda M, N nuqtalar shunday olinganki, $AM : MC = CN : NB$ munosabat bajariladi. Agar AB kesma uzunligi 12 ga teng bo'lsa, MN kesma uzunligini toping.

A) 6 B) 2 C) 4 D) 3

20. Qirralari 18, 14 va 16 bo'lgan parallepiped qirrasi 1 ga teng bo'lgan kubchalardan tashkil topgan. Parallepipeddan 1 kubcha qalinligidagi tashqi sirtni olib tashlash uchun nechta kubcha olinishi kerak?

A) 1434 B) 1344 C) 717 D) 1336

21. $\frac{\sqrt{x^2 + x - 12}}{x - 3} = 0$ tenglamani yeching.

A) -4 B) $\{-4; 3\}$ C) $[-4; \infty)$ D) $\emptyset$

22. $a_1, a_2, \ldots, a_8$ ketma – ketlikda ixtiyoriy uchta ketma – ket hadining yig'indisi 40 ga teng. Agar ketma – ketlikning uchinchi hadi 9 ga teng bo'lsa,

birinchi va sakkizinchi hadlarining yig'indisi nechaga teng.

A) 18 B) 31 C) 33 D) 9

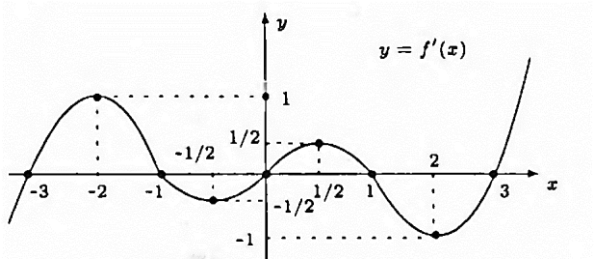
23. Tenglamani yeching. $|5x-15|-|4x+20|=|x-3|$

A) -1 B) 2 C) $-0{,}5$ D) 1

24. $(0{,}2)^{\frac{1}{2}\log_5 4-\log_{25} 10}$ ni hisoblang.

A) 2 B) $\sqrt{2}$ C) 4 D) 8

25. Rasmda $y=f'(x)$ funksiya grafigi tasvirlangan. $y=f(x)$ funksiya maksimum nuqtalari koordinatalarini toping.



A) $-2;\frac{1}{2}$ B) $-3;0;3$ C) $-3;-1;0;1;3$ D) $-1;1$

26. $y=\cos x$ funksiya grafigi berilgan bo'lib, uni parallel ko'chirish yordamida $y=\cos(x+a)-b$ funksiya grafigi hosil qilingan. Bunday parallel ko'chirishda koordinata boshi qanday nuqtaga ko'chadi?

A) $N(b;a)$ B) $N(-a;b)$ C) $N(a;b)$ D) $N(-a;-b)$

27. Natural sonlardan birini ikkinchisiga bo'lganda, shunday o'nli kasr hosil bo'ldiki, uning butun qismi bo'luvchiga, kasr qismi esa bo'linuvchiga teng bo'ldi. Bo'linuvchini toping.

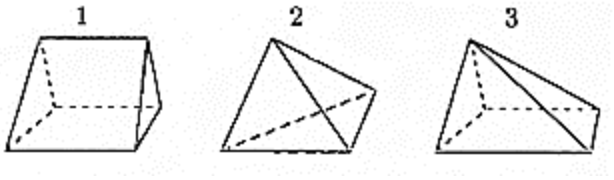
A) 10 B) 3 C) 2 D) 5

28. Ushbu $f(x)=\frac{x+3}{x+4}$ funksiyaning boshlang'ich funksiyasini toping.

A) $x-\ln|x+4|+C$ B) $x+4\ln|x+4|+C$

C) $\ln(x+4)^2+C$ D) $\frac{2x^2}{(x+4)^2}+C$

29. Quyidagi ko'pyoqlardan qaysi birida 5 ta yoq bor?



A) 1 B) 1,3 C) 3 D) 2

30. $\{x|x\in N,-4\le x<5\}$ to'plamni nechta usul bilan ikkita kesishmaydigan qism – to'plamlarga ajratish mumkin?

A) 16 B) 8 C) 4 D) 32

MATEMATIKA

2016.13.

1. Tenglamani yeching: $2^{x-2}+2^{x-3}+2^{x-4}=224$

A) 7 B) 10 C) 11 D) 9

2. O'zaro teng bo'lmagan x va y sonlari $x^2+24y=y^2+24x$ tenglikni qanoatlantirsa, $x+y$ ni toping.

A) 24 B) 12 C) 0 D) 34

3. a va b natural sonlarning eng katta umumiy bo'luvchisi 6 ga teng bo'lsa, $a+3b$ va b sonlarning eng katta umumiy bo'luvchisi nimaga teng.

A) 1 B) 6 C) 4 D) *bir qiymatli aniqlab bo'lmaydi*

4. $2\sqrt{1-x^2}=x-2$ tenglamani yeching.

A) $\frac{4}{5}$ B) 0 C) $\emptyset$ D) $0;\frac{4}{5}$

5. Poyezd 2 minutda 5 kilometr masofani, motosikl 3 minutda 4 kilometr masofani bosib o'tadi. Motosiklchining tezligi poyezd tezligining necha foizini tashkil etadi?

A) $67\frac{2}{3}\%$ B) $53\frac{1}{3}\%$ C) $66\frac{2}{3}\%$ D) 70%

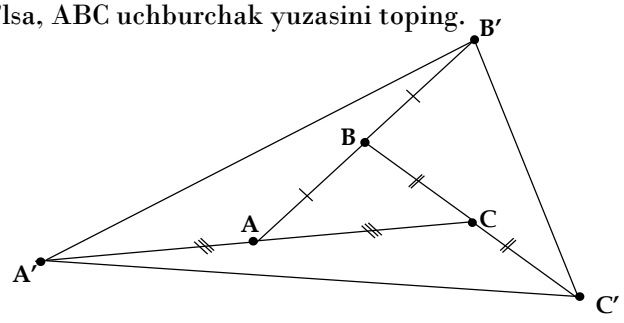
6. $60°$ ga teng bo'lgan A burchakka aylana ichki chizilgan. Bu aylana burchak tomonlariga B va C nuqtalarda urinadi. Agar $BC=3$ bo'lsa, $AB+AC$ ni toping.

A) 6 B) 3 C) *bir qiymatli aniqlab bo'lmaydi* D) 4

7. $\dfrac{\frac{1}{\sqrt{a}+\sqrt{b}}+\frac{1}{\sqrt{a}-\sqrt{b}}}{\frac{1}{\sqrt{a}-\sqrt{b}}-\frac{\sqrt{b}}{a-b}}$ ni soddalashtiring. $(a>0, b>0, a\neq b)$

A) $2a$ B) -2 C) 2 D) $-2a$

8. ABC uchburchakning har bir tomoni chizmada ko'satilgandek o'z uzunligiga teng uzunlikda davom ettirilgan. Agar A'B'C' uchburchak yuzasi 28 teng bo'lsa, ABC uchburchak yuzasini toping.



A) 2 B) 5 C) 3 D) 4

9. Tenglamalar sistemasini yeching:

$$\begin{cases} 2x-y+2z=7 \\ 2x+5y-z=0 \\ 4x-3y+z=6 \end{cases}$$

A) 1 B) 2,5 C) 3 D) 4

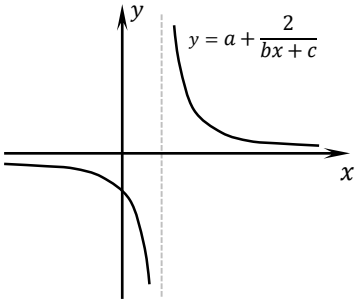
10. 3234 va 3235 sonlarning umumiy natural bo'luvchilari nechta?

A) 4 B) 2 C) 0 D) 1

11. Prizmaning qirralari soni 72 ga teng. Uning yoqlari sonini toping.

A) 26 B) 72 C) 24 D) *bir qiymatli aniqlab bo'lmaydi*

12. Rasmda $y=a+\frac{2}{bx+c}$ funksiya grafigi tasvirlangan. quyidagilardan qaysi biri doim o'rinli.



A) $ac^3+b>0$ B) $c^3-b^3>0$ C) $abc>0$ D) $bc>0$

13. Hisoblang:

$$(1+\text{tg}7°)(1+\text{tg}8°)(1+\text{tg}37°)(1+\text{tg}38°)$$

A) 8 B) 16 C) 2 D) 4

14. $(0{,}2)^{\frac{1}{2}\log_5 4-\log_{25}16}$ ni hisoblang.

A) $\sqrt{2}$ B) 4 C) 2 D) 8

15. $y=3\cos^2 x+\sin^2 x$ funksiya nechta butun qiymatni qabul qiladi?

A) *cheksiz ko'p* B) 3 C) 0 D) 2

16. Muntazam uchburchakli piramida asosining tomonidan unga ayqash yon qirraga perpendikulyar bo'lgan tekislik o'tkazilgan. Kesuvchi tekislik yon qirrani uchidan hisoblaganda 3:2 nisbatda kesadi. Asos tomoni $6\sqrt{2}$ ga teng bo'lsa, piramida yon sirtining yuzini toping.

A) 54 B) 72 C) 90 D) 108

17. ABCD trapetsiyaning AD va BC asoslari mos ravishda 9 va 5 ga teng. Agar ACD uchburchakning yuzi 18 ga teng bo'lsa, berilgan trapetsiyaning yuzini toping.

A) 22 B) 28 C) 24 D) 32

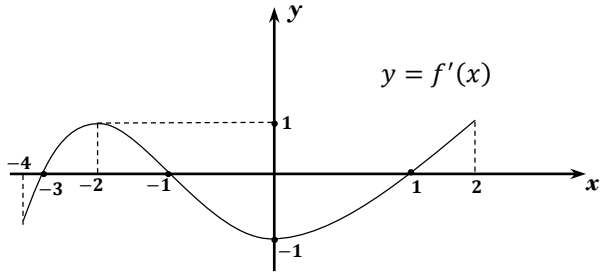
18. $\{x|x\in N, 2\le x^2\le 34\}$ to'plamni nechta bo'sh bo'lmagan qism – to'plami mavjud?

A) 15 B) 16 C) 34 D) 5

19. $y=\frac{1}{\sqrt{x}}; y=0; x=1; x=4$ chiziqlar bilan chegaralangan shaklning yuzini toping.

A) 8 B) 0,5 C) 4 D) 2

20. Rasmda $y = f'(x)$ funksiya grafigi berilgan. $y = f(x)$ funksiya ekstremum nuqtalari absissalari o'rta arifmetigini toping. $x \in [-3; 1]$



A) -2 B) $-0{,}5$ C) -1 D) $-1{,}5$

21. Bir odam shunday vasiyat qildi: Naqd n dirham pulim bor. Bir kishiga qarz ham berganman. Qarzning miqdori o'g'lim oladigan merosga teng. Ikkala o'g'lim barobar meros olishsin. Ukamga jami merosning $1/5$ qismini va yana 1 dirham beringlar. Ul kishining o'g'illari necha dirhamdan meros olishgan.

A) $\frac{4n-5}{6}$ B) $\frac{4n+3}{6}$ C) $n-4$ D) $\frac{2n+5}{3}$

22. $y = f(x)$ funksiya grafigi berilgan bo'lib, uni parallel ko'chirish yordamida $y = f(x+a) - b$ funksiya grafigi hosil qilingan. Bunday parallel ko'chirishda koordinata boshi qaysi nuqtaga ko'chadi?

A) $N(-a; b)$ B) $N(a; -b)$
C) $N(a; b)$ D) $N(-a; -b)$

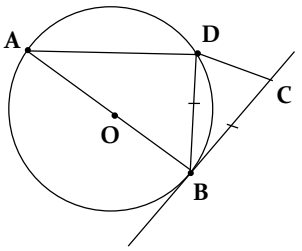
23. $a_1, a_2, \dots, a_8$ ketma – ketlikda ixtiyoriy uchta ketma – ket hadining yig'indisi 40 ga teng. Agar ketma – ketlikning uchinchi hadi 6 ga teng bo'lsa, birinchi va sakkizinchi hadlarining yig'indisi nechaga teng.

A) 6 B) 34 C) 12 D) 36

24. $x^8 - 18x^4 + 32 \le 0$ tengsizlikning barcha butun yechimlari ko'paytmasini toping.

A) 4 B) 2 C) -4 D) -2

25. Rasmga ko'ra $\angle BAD = 40°, BD = BC$ bo'lsa, $\angle DCB$ ni toping.



A) 40° B) 50° C) 80° D) 70°

26. $y = 3 + (a-1)x + ax^2$ parabolaning uchi y o'qi ustida bo'lsa, a ni toping.

A) 1 B) 3 C) 2 D) 0

27. Qaysi jismlarning simmetriya o'qlari chekli sonda?
1) shar; 2) prizma; 3) konus

A) 3 B) 1 C) 2, 3 D) 2

28. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quyidagicha berilgan: $A(0;0), B(1;1), C(2;0)$. Uchburchakning yuzini toping.

A) 1 B) 2 C) $\sqrt{3}$ D) $\sqrt{2}$

29. $|x^2 - 4ax| = a$ tenglama uchta haqiqiy yechimga ega bo'ladigan a ning barcha qiymatlari yig'indisini toping.

A) $\frac{1}{4}$ B) -1 C) 1 D) 0

30. $a = 3$ bo'lsa, $\int_a^{a+1} \left(\ln\left(\sin^2 3x + \cos^2 3x\right) + 1\right) dx$ aniq integralni hisoblang.

A) 1 B) $\frac{\ln 2 - 1}{3}$ C) $2\sqrt{2}$ D) $\sqrt{2}$

MATEMATIKA

2016.14.

1. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quyidagicha berilgan: $A(0;0), B\left(-\frac{1}{2}; h\right), C(a;0)$. Uchburchak yuzini toping.

A) $|ah|\sqrt{2}$ B) $\frac{|ah|}{2}$ C) $\frac{|ah|}{4}$ D) $\frac{|a|\sqrt{a^2+h^2}}{2}$

2. To'g'ri tenglikni aniqlang:

A) $(-2)^{\frac{1}{3}} = \sqrt[3]{2}$

B) $\left(\log_5\left(5\sin^2\frac{4\pi}{11} + 5\sin^2\frac{3\pi}{22}\right) - 1\right)^0 = 1$

C) $\left(\sqrt{x-2}\right)^2 = |x-2|$

D) $\frac{4(n^2-n-2)}{5(2-n)} = -\frac{4}{5}(n+1), n \neq 2$

3. $y = 3\cos x + \cos 3x$ funksiyaning hosilasini toping.

A) $6\sin x \cdot \cos 2x$ B) $-6\cos x \cdot \sin 2x$
C) $6\sin x \cdot \sin 2x$ D) $6\cos x \cdot \cos 2x$

4. $y = 1 - \sin 2x; y = 0; x = 0; x = \pi$ chiziqlar bilan chegaralangan shaklning yuzini toping.

A) $\pi + 1$ B) π C) $\pi - 1$ D) $\frac{\pi}{2}$

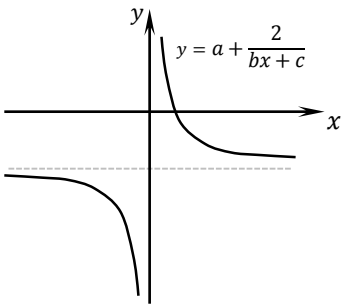
5. Sharga asosining tomoni $3\sqrt{2}$ ga, balandligi 4 ga teng bo'lgan muntazam to'rtburchakli piramida ichki chizilgan. Shar radiusini toping.

A) 3,125 B) 2,25 C) 3 D) 3,5

6. $60°$ ga teng bo'lgan A burchakka aylana ichki chizilgan. Bu aylana burchak tomonlariga B va C nuqtalarda urinadi. Agar $BC = 3$ bo'lsa, $AB + AC$ ni toping.

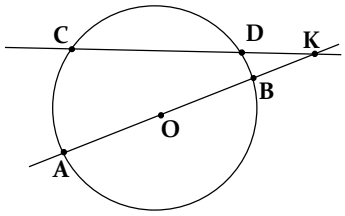
A) 4 B) 3 C) 6 D) *bir qiymatli aniqlab bo'lmaydi*

7. Rasmda $y = a + \frac{2}{bx+c}$ funksiya grafigi tasvirlangan. quyidagilardan qaysi biri doim o'rinli.



A) $cb + a > 0$ B) $a^3 - b^3 > 0$ C) $ca + ab > 0$
D) $b^3 - a^5 > 0$

8. Rasmga qarab noto'g'ri tasdiqni aniqlang.



A) AB va CD to'g'ri chiziqlar keishish nuqtasi, markazi O nuqtada bo'lgan doira tashqarisida joylashgan
B) ODK siniq chiziq uzunligi OK kesma uzunligiga teng
C) AB kesma uzunligi CD kesma uzunligidan katta
D) AB – aylana diametri

9. $y = \log_2(\text{arctg}\, 2x + \text{arcctg}\, 2x)$ funksiyaning $x = \frac{1}{2}$ nuqtadagi ikkinchi tartibli hosilasining qiymatini toping.

A) $-\log_2 2$ B) 0 C) $\log_2 3$ D) 1

10. $\{x | x \in N, 3 \leq x^2 \leq 35\}$ to'plamni nechta usul bilan ikkita kesishmaydigan qism – to'plamlarga ajratish mumkin?

A) 16 B) 8 C) 32 D) 5

11. $[200; 700]$ kesmada 2, 3, 5 va 7 sonlariga bo'linganda qoldiq 1 ga teng bo'ladigan natural sonlar nechta?

A) 3 B) 2 C) 4 D) 1

12. $y = 5\sin^2 x + \cos^2 x$ funksiya nechta butun qiymatlarni qabul qiladi?

A) *cheksiz ko'p* B) 0 C) 6 D) 5

13. Agar $\begin{cases} x^2 + (y+a)^2 - 1 = 0 \\ x^2 + y = b \end{cases}$ tenglamalar sistemasi yagona yechimga ega bo'lsa, $a + b$ ni toping.

A) 1 B) 0 C) -1 D) *bir qiymatli aniqlanmaydi*

14. O'zaro teng bo'lmagan x va y sonlari $x^2 + 26y = y^2 + 26x$ tenglikni qanoatlantirsa, $x + y$ ni toping.

A) 26 B) 0 C) 16 D) 24

15. Ox o'qidan 2 marta, Oy o'qidan 3 marta qisish orqali $y=\operatorname{arctg} x$ funksiya grafigidan qaysi funksiyaning grafigi hosil qilinadi?

A) $y=2\operatorname{arctg} 3x$ B) $y=\frac{1}{2}\operatorname{arctg} 3x$

C) $y=2\operatorname{arctg}\frac{x}{3}$ D) $y=\frac{1}{2}\operatorname{arctg}\frac{x}{3}$

16. Katetlari $3-2\sqrt{2}x+x^2=0$ tenglama ildizlariga teng bo'lgan to'g'ri burchakli uchburchakning yuzini toping.

A) 5 B) 2 C) 4 D) 1,5

17. $\dfrac{\left(\sqrt[3]{x}+\sqrt[3]{y}\right)\left(x^2-y^2\right)}{\sqrt[3]{x^5}+\sqrt[3]{x^2y^3}-\sqrt[3]{x^3y^2}-\sqrt[3]{y^5}}-\left(\sqrt[3]{xy}+\sqrt[3]{y^2}\right)$

ifodani soddalashtiring va $x=64; y=\frac{31}{78}$ da son qiymatini toping.

A) 12 B) 18 C) 15 D) 16

18. Samandarning o'g'il bola sinfdoshlari soni qiz bola sinfdoshlari sonidan 7 taga ko'p. Sinfda o'g'il bolalar soni qiz bolalar sonidan 2 marta ko'p. Diyora Samandarning sinfdoshi. Diyoraning sinfdosh dugonalari nechta?

A) 9 B) 7 C) 8 D) 6

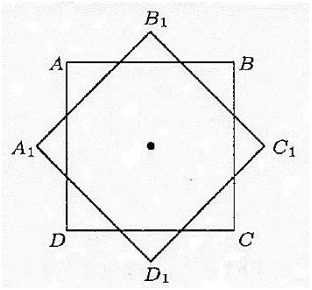
19. $(0{,}2)^{\frac{1}{2}\log_5 4-\log_{25} 16}$ ni hisoblang.

A) 2 B) $\sqrt{2}$ C) 8 D) 4

20. $a=2$ bo'lsa, $\int_a^{a+1}\left(\ln\left(\sin^2 3x+\cos^2 3x\right)+1\right)dx$ aniq integralni hisoblang.

A) 1 B) $2\sqrt{2}$ C) $\sqrt{2}$ D) $\frac{\ln 2-1}{3}$

21. Tomoni a ga teng bo'lgan ABCD kvadrat simmetriya markaziga O nuqta orqali 45° ga burilib, rasmdagidek shaklga keltirildi. Hosil bo'lgan botiq ko'pburchakning perimetri aniqlansin.



A) $8\left(\sqrt{2}-1\right)a$ B) $8\sqrt{2}a$

C) $8\sqrt{2}\left(\sqrt{2}-1\right)a$ D) $\left(16-4\sqrt{2}\right)a$

22. $x\sqrt{3-2x-x^2}\geq 0$ tengsizlikni yeching.

A) $[0;1]$ B) $[0;\infty)$ C) $[1;\infty)$ D) $\{-3\}\cup[0;1]$

23. Ikki sonning nisbati 3 ga, ayirmasi esa 30 ga teng. Shu sonlarni toping.

A) (46; 16) B) (55; 25) C) (45; 12) D) (45; 15)

24. $2\cos^2 x+3\cos x>0$ tengsizlikning $[0;2\pi]$ kesmadagi yechimlari to'plamini toping.

A) $\left(0;\frac{\pi}{2}\right)$ B) $\left[0;\frac{\pi}{3}\right]\cup\left[\frac{3\pi}{2};2\pi\right]$ C) $[0;\pi]$

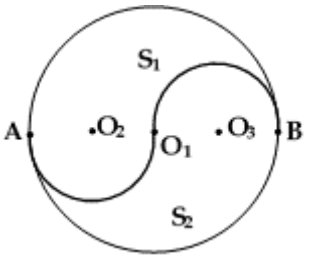
D) $\left[0;\frac{\pi}{2}\right)\cup\left(\frac{3\pi}{2};2\pi\right]$

25. Agar $\alpha=75°$ va $\beta=90°$ bo'lsa, $\sin\alpha\cdot\sin(\beta-\alpha)+\sin^2\left(\frac{\beta}{2}-\alpha\right)$ ni hisoblang.

A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{2-\sqrt{3}}{4}$ D) $\frac{\sqrt{2}}{4}$

26. $\dfrac{x+6}{x(x-7)}-\dfrac{4}{(7-x)^2}=\dfrac{1}{x-7}$ tenglamani yeching.

A) 42 B) 4,2 C) 2,1 D) 21



27. Rasmda AB katta aylana diametri, O_1 katta aylana markazi, O_2 va O_3 kichik aylanalar markazlari bo'lib, ular uchun $AO_1:O_1O_2=O_2O_3:O_3B$ tenglik o'rinli. S_1 va S_2 sohalar perimetri yig'indisini

ifodalaydigan son S_1 soha yuzini ifodalaydigan sondan 25% ga kichik bo'lsa, S_1 va S_2 sohalar yuzlariyig'indisini toping.

A) $170,(6)\pi$ B) $56,(8)\pi$ C) $100,(3)\pi$ D) $113,(7)\pi$

28. Qavariq ko'pyoqning uchlari soni bilan yoqlari soni yig'indisi 12 ga teng bo'lsa, uning qirralari sonini toping.

A) *bir qiymatli aniqlab bo'lmaydi* B)14 C) 12 D) 10

29. Geometrik progressiya $n-$ hadi $b_n = \frac{1}{3}\cdot 5^{n+1}$ ga teng. Progressiya maxrajini toping.

A) 0,5 B) 0,2 C) -5 D) 5

30. $\sqrt[3]{x^{\log_3 \sqrt[3]{x}}} > 3$ tengsizlikning yechimi bo'lmaydigan eng katta va eng kichik juft sonlar ayirmasini toping.

A) 26 B) 28 C) 24 D) 22

MATEMATIKA

2016.15.

1. Agar $\alpha = 17°$ va $\beta = 150°$ bo'lsa, $\sin\alpha\cdot\sin(\beta-\alpha)+\sin^2\left(\frac{\beta}{2}-\alpha\right)$ ni hisoblang.

A) $\frac{2-\sqrt{3}}{4}$ B) 6,25 C) 0,5 D) $\frac{2+\sqrt{3}}{4}$

2. $x=-y, z=-2$ bo'lsa, $\frac{x^3+y^3+z^3-3xyz}{x^2+y^2+z^2-xy-yz-xz}$ ifodaning qiymatini toping.

A) -2 B) 1 C) 0 D) 2

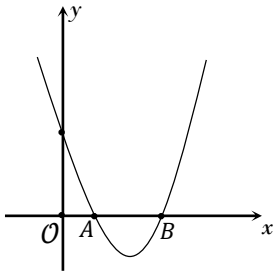
3. Quyida keltirilgan sonlardan qaysi biri $[4;5]$ oraliqqa tegishli?

A) $\left(\frac{2\sqrt{3}}{3}\right)^2$ B) $\frac{5\sqrt{6}}{\sqrt{75}}$ C) $\frac{5\sqrt{3}}{\sqrt{15}}$ D) $2\sqrt{5}$

4. C nuqta – AB kesmaning o'rtasi, AC va BC kesmalarda mos ravishda M, N nuqtalar shunday olinganki, $AM:MC = CN:NB$ munosabat bajariladi. Agar AB kesma uzunligi a ga teng bo'lsa, MN kesma uzunligini toping.

A) $\frac{a}{2}$ B) $\frac{a}{3}$ C) $\frac{a}{4}$ D) $\frac{a}{6}$

5. Rasmda $y = x^2 - 5x - 2m + 2$ funksiyaning grafigi – parabola berilgan bo'lib, uning uchun $OB - OA = 3$ bo'lsa, m ning qiymati qanday?



A) $-1,\ 5$ B) -2 C) -1 D) 1

6. Tenglamani yeching: $2^{x-2}+2^{x-3}+2^{x-4}=224$

A) 7 B) 11 C) 10 D) 9

7. 2 va 162 sonlari orasiga shunday 3 ta son qo'yildiki, ular birgalikda ishorasi almashinuvchi geometrik progressiyani tashkil qildi. Oraga qo'yilgan sonlar yig'indisini toping.

A) -42 B) 78 C) 42 D) 0

8. $x-\sqrt{2x}-4=0$ tenglamaning haqiqiy ildizlari ko'paytmasini (ildiz yagona bo'lsa o'zini) toping.

A) 16 B) 32 C) 8 D) -8

9. $a=-5$ bo'lsa, $\int_a^{a+2}\left(\ln\left(\sin^2 3x+\cos^2 3x\right)+1\right)dx$ aniq integralni hisoblang.

A) 2 B) $\sqrt{2}$ C) 1 D) $\frac{\ln 2-1}{3}$

10. $2^{10}\cdot 5^9\cdot 4^6\cdot 25^4$ ko'paytma necha xonali son bo'ladi?

A) 20 B) 18 C) 17 D) 19

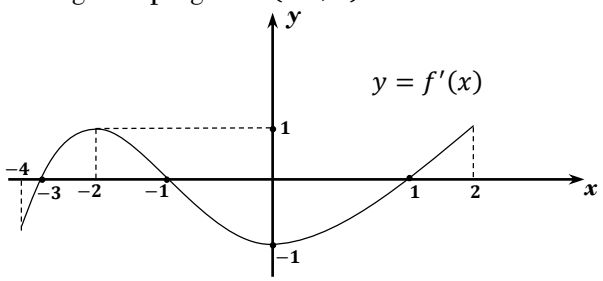
11. To'g'ri burchakli ΔABC ning AB gipotenuzasiga C uchdan o'tkazilgan CO mediana va CE balandliklar nisbatini $BE:BO = 1:5$ kabi bo'lganda aniqlang.

A) 2/3 B) 7/2 C) 5/2 D) 5/3

12. Geometrik progressiya $n-$ hadi $b_n=\frac{1}{3}\cdot 5^{n+1}$ ga teng. Progressiyaning maxrajini toping.

A) 0,2 B) 0,5 C) 5 D) -5

13. Rasmda $y=f'(x)$ funksiya grafigi beilgan. $y=f(x)$ funksiya ekstremum nuqtalari absissalari o'rta arifmetigini toping. $x\in(-3;1)$



A) -1 B) $-0{,}5$ C) -2 D) $-1{,}5$

14. $\sqrt[3]{x^{\log_3\sqrt[3]{x}}}>3$ tengsizlikning yechimi bo'lmaydi gan eng katta natural sonni toping.

A) 27 B) 11 C) 28 D) 12

15. Ox o'qdan 2 marta qisish, Oy o'qdan 3 marta cho'zish orqali $y=\cos x$ funksiya grafigidan qaysi funksiyaning grafigi hosil qilinadi?

A) $y=2\cos 3x$ B) $y=\frac{1}{2}\cos 3x$
C) $y=2\cos\frac{x}{3}$ D) $y=\frac{1}{2}\cos\frac{x}{3}$

16. Agar $[a]=[b]$ bo'lsa, ($[x]-x$ ning butun qismi), u holda a va b haqiqiy sonlar uchun qanday munosabat doim o'rinli?

A) $|a-b|\le 1$ B) $|a-b|<1$ C) $a=b$ D) $a,b\in Z$

17. $5^{2\sqrt{x}}+5^{\sqrt{x}}<5+5^{\sqrt{x}}+1$ tengsizlikni yeching.

A) $[1;2]$ B) $[0;1)$ C) $(0;1)\cup(1;2]$
D) $[0;1)\cup(1;2]$

18. $\frac{|2-3x|-7}{x+1}\ge -1$ tengsizlikni yeching.

A) $[-2;-1]\cup(2;\infty)$ B) $[-2;-1)$
C) $[-2;-1)\cup[2;\infty)$ D) $[2;\infty)$

19. $y>0$ bo'lsin. To'rtburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quyidagicha berilgan: $A(1;0),B(1;y),C(-5;y)$ va $D(-7;0)$. To'rtburchak diagonallarining o'rtalari orasidagi masofani toping.

A) *y ga bog'liq* B) 1 C) 2 D) $\sqrt{2}$

20. Agar $\vec{a}(-4;3;5)$ va $\vec{b}(3;-4;\sqrt{2})$ berilgan bo'lsa, $\frac{|\vec{a}|}{\sqrt{2}}-\frac{|\vec{b}|}{\sqrt{3}}$ ni hisoblang.

A) -1 B) 1 C) 2 D) 3

21. $\begin{cases}x^2+y^2=2(xy+2)\\ x+y=6\end{cases}$ tenglamalar sistemasidan $|x-y|$ ni toping.

A) 0 B) 1 C) 3 D) 2

22. $y=\log_2(\operatorname{arctg}3x+\operatorname{arcctg}3x)$ funksiyaning $x=\frac{1}{2}$ nuqtadagi ikkinchi tartibli hosilasining qiymatini toping.

A) 1 B) $\log_7 2$ C) $-\log_7 2$ D) 0

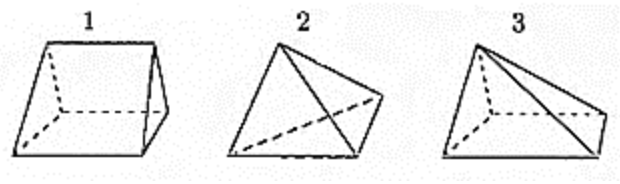
23. Sharga asosining tomoni $4\sqrt{2}$ ga, balandligi 8 ga teng bo'lgan muntazam to'rtburchakli piramida ichki chizilgan. Shar radiusini toping.

A) 5 B) 4,5 C) 4,25 D) 4

24. $y=-3\cos^2 x-\sin^2 x$ funksiya nechta butun qiymatlarni qabul qiladi?

A) 2 B) 0 C) 3 D) *cheksiz ko'p*

25. Quyidagi ko'pyoqlardan qaysi birida 4 ta yoq bor?

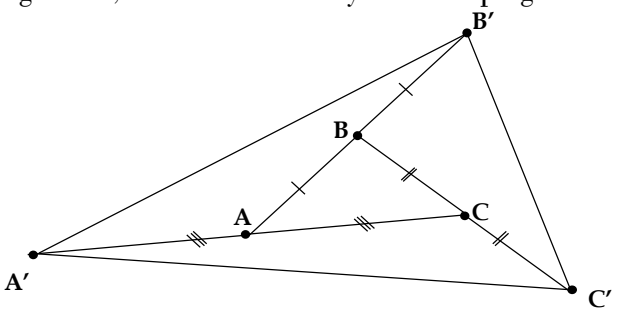


A) 3 B) 1,3 C) 1 D) 2

26. $-b^{\frac{1}{3}}+\dfrac{a^{-\frac{4}{3}}b^{-2}-a^{-2}b^{-\frac{4}{3}}}{a^{-\frac{5}{3}}b^{-2}-a^{-2}b^{-\frac{5}{3}}}+a^{\frac{1}{3}}$ ni soddalashtiring.
$(a\ne b;a\cdot b\cdot(a-b)\ne 0)$

A) $2a^{\frac{1}{3}}$ B) $a^{\frac{1}{3}}+b^{\frac{1}{3}}$ C) $a^{\frac{1}{3}}-b^{\frac{1}{3}}$ D) 1

27. ABC uchburchakning har bir tomoni chizmada ko'satilgandek o'z uzunligiga teng uzunlikda davom ettirilgan. Agar $A'B'C'$ uchburchak yuzasi $28\sqrt{2}$ ga teng bo'lsa, ABC uchburchak yuzasini toping.



A) $2\sqrt{2}$ B) $5\sqrt{2}$ C) 3 D) $4\sqrt{2}$

28. $\{x|x \in N, 2 \le x^2 \le 38\}$ to'plamning nechta bo'sh bo'lmagan qism – to'plamlari mavjud?

A) 6 B) 37 C) 31 D) 15

29. Parallepipedning asoslari tomoni 6 ga teng kvadratlardan, barcha yon yoqlari romblardan iborat. Yuqori asosinng uchlaridan biri ostki asosining barcha uchlaridan baravar uzoqlikda joylashgan. Parallepipedning hajmini toping.

A) $72\sqrt{2}$ B) $54\sqrt{2}$ C) $108\sqrt{2}$ D) 81

30. $x^{x^2-x-6} = 1$ tenglamaning ildizlari ko'paytmasini toping.
$(x > 0)$

A) -6 B) 3 C) 6 D) $\emptyset$

MATEMATIKA

2016.16.

1. Parallepipedning asoslari tomoni 4 ga teng kvadratlardan, barcha yon yoqlari romblardan iborat. Yuqori asosinng uchlaridan biri ostki asosining barcha uchlaridan baravar uzoqlikda joylashgan. Parallepipedning hajmini toping.

A) 8 B) $32\sqrt{2}$ C) $8\sqrt{2}$ D) $16\sqrt{2}$

2. $y = -x^2 + 3x + 1$ va $y = (x-2)^2$ funksiyalar kesishish nuqtalari ordinatalarining yig'indisini toping.

A) 4,25 B) 3,25 C) 2,5 D) 1

3. $[200; 700]$ kesmada 2, 3, 5 va 7 sonlariga bo'linganda qoldiq 1 ga teng bo'ladigan sonlar nechta?

A) 4 B) 1 C) 2 D) 3

4. $\{x|x \in N, x^2 \le 36\}$ to'plamning nechta qism-to'plamlari mavjud?

A) 64 B) 5 C) 16 D) 32

5. $e^{\ln^2 x} + x^{\ln x} = 2e^4$ tenglamani yeching.

A) $\frac{1}{e^2}; e^2$ B) $\frac{1}{e}; e^2$ C) $\frac{1}{e^2}; e$ D) $\frac{1}{e}; e$

6. $y = f(x)$ funksiya D to'plamda kamayuvchi bo'lsin. D to'plamdan oligan ixtiyoriy a va b elementlari $(a > b)$ quyidagi unosabatlardan qaysi biri o'rinli?

A) $f(b) < f(a)$ B) $f(a) < f(b)$ C) $f(b) \le f(a)$
D) $f(a) \le f(b)$

7. ABC uchburchakning BC tomoniga tushirilgan AD kesma ADC teng yonli uchburchak (AC asosli) hosil qiladi. Agar ABD va ABC uchburchaklarning perimetrlari mos ravishda 27 *sm* va 39 *sm* ga teng bo'lsa, AC ni (*sm*) toping.

A) 13 B) 15 C) 12 D) 10

8. Agar $f(x) = \frac{2-x}{1-2x}$ bo'lsa, $(f \circ f)(x)$ ni toping.

A) $\frac{x-2}{10x-5}$ B) $\frac{1}{x}$ C) $\frac{1}{2}x$ D) x

9. $y = 1 + 2(\sin^2 x - 3\sin 4x) + \cos 8x + \cos 2x$ funsiyaning qiymatlar sohasiga tegishli nomanfiy butun sonlarning o'rta arifmetigini toping.

A) 7/2 B) 7 C) 14 D) 4

10. ABCD parallelogrammda A burchakdan o'tkazlgan bissektrisa BC tomonni E nuqtada kesib

o'tadi. Agar AB=9 sm va AD=15 sm bo'lsa, BE va EC kesmalarni (sm) toping.

A) 5; 10 B) 10; 5 C) 6; 9 D) 9; 6

11. $\log_{3,5}\left(\sqrt{2x+3}-x\right)>0$ tengsizlikni yeching.

A) $[3;5)$ B) $(0;2)$ C) $[0;2)$ D) $\left[-1,5;\sqrt{2}\right)$

12. $\dfrac{ab}{a+b}\cdot\sqrt[n]{(a+b)^{n-1}\cdot\left(\dfrac{1}{a^{n-3}b^{n-2}}+\dfrac{1}{a^{n-2}b^{n-3}}\right)}$

ifodani soddalashtiring.

A) 0 B) $(ab)^{\frac{2}{n}}$ C) $(ab)^{\frac{1}{n}}$ D) 1

13. Tenglama ildizlari yig'indisini toping:

$$|\log_4(|x|+3)|=|x|$$

A) 1 B) -1 C) 0 D) 2

14. Berilgan ABC uchburchakda E nuqta – AC tomonning o'rtasi. BC tomonda D nuqta shunday olinganki, $2BD=DC$ munosabat o'rinli. AD va BE to'g'ri chiziqlar F nuqtada kesishsin. Agar FDCE to'rtburchakning yuzasi 20 ga teng bo'lsa, BDF uchburchak yuzasini toping.

A) 4 B) 3 C) 7,5 D) 5

15. $3(\sin^4\alpha+\cos^4\alpha)-2(\sin^6\alpha+\cos^6\alpha)$ ifodaning $\alpha=-105°$ bo'lgandagi qiymatini toping.

A) $\frac{\sqrt{3}}{2}$ B) 1 C) $\frac{\sqrt{2}}{2}$ D) $\sqrt{3}$

16. Tenglama nechta butun yechimga ega:

$$\sqrt{2x-x^2}=2\ln|x-1|$$

A) 3 B) 2 C) 1 D) 0

17. $y=f(x)$ funksiyaning eng kichik musbat davri $\tau_0=\frac{3}{5}$ bo'lsa, quyidagilardan qaysi biri yana $y=f(x)$ funksiyaning davri bo'lishi mumkin?

A) $\frac{3}{4}$ B) $\frac{3}{2}$ C) 6 D) $\frac{3}{10}$

18. $x=-y, z=-2$ bo'lsa,

$$\frac{x^3+y^3+z^3-3xyz}{x^2+y^2+z^2-xy-yz-xz}$$

ifodaning qiymatini toping.

A) 0 B) 2 C) 1 D) -2

19. $f(x)=(\sin x)^{\cos x}$ bo'lsa, $f'\left(\frac{5\pi}{6}\right)$ ni toping.

A) $\dfrac{1-\sqrt{3}}{2}$ B) $\frac{\ln 2}{3}$ C) $\left(\dfrac{\ln 2+3}{2}\right)\left(\sqrt{2}\right)^{-\sqrt{3}}$

D) $\left(\dfrac{\ln 2-3}{2}\right)\left(\sqrt{2}\right)^{\sqrt{3}}$

20. Teng yonli trapetsiyaning asoslari 4 va 12 bo'lsa, unga ichki chizilgan doira yuzini toping.

A) 18π B) 12π C) 16π D) 8π

21. Tenglamaning ildizlari yig'indisini toping:

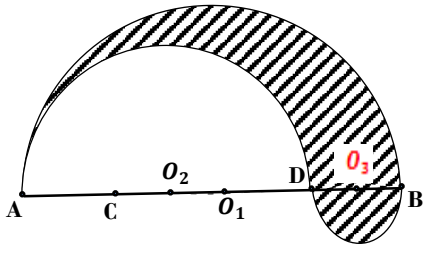
$$\arcsin(x^2-5x)=\arccos\left(-\frac{\sqrt{3}}{2}\right)$$

A) 5 B) 2,5 C) $\emptyset$ D) 10

22. 36 sonining natural bo'luvchilari ko'patmasini toping.

A) 6^9 B) 6^8 C) 6^7 D) 6^6

23. Rasmdag shtrixlangan soha yuzi aniqlansin. Bu yerda Ab, AD, Bd – doiralarning diametrlari, O_1, O_2, O_3 – doiralarning markazlari va $Ab=8=4AC=4CO_1=4O_1D=4DB$.



A) 32π B) 16π C) 8π D) 4π

24. To'g'ri burchakli uchburchakning gipotenuzasiga tushirilgan balandligi va bissektrisasi mos ravishda h va l ga teng bo'lsa, uchburchakning yuzasini toping.

A) $h^2 - l^2$ B) $h \cdot l$ C) $\frac{l^2h^2}{h^2+l^2}$ D) $\frac{l^2h^2}{2h^2-l^2}$

25. $\int_0^1 2x^3 dx$ integralni hisoblang.

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{2}{3}$ D) $\frac{3}{5}$

26. To'rtburchakli muntazam prizma diagonali d ga teng bo'lib, yon yoq tekisligi bilan α burchak tashkil etadi. Prizma hajmini toping.

A) $d^3 \sin^2\alpha \cdot \sqrt{\cos\alpha}$ B) $d^3 \sin^3\alpha \cdot \sqrt{\sin 2\alpha}$

C) $d^3 \sin^2\alpha \cdot \sqrt{\cos 2\alpha}$ D) $d^3 \sin^3\alpha \cdot \sqrt{\cos 2\alpha}$

27. Hisoblang:

$$\log_2\left(\frac{3}{0,(4)}+\frac{3}{0,(6)}+\frac{3}{0,(8)}+1{,}375\right)$$

A) 1 B) 4 C) $\log_2 3$ D) 2

29. $a = 1$ bo'lsa, $\sqrt{2a-\sqrt{a^2+2}} \cdot \sqrt{2a+\sqrt{a^2+2}}$ ifodaning qiymatini toping.

A) $\sqrt{3}$ B) 1 C) $\sqrt{5}$ D) 2

30. To'la sirti $36\,sm^2$ bo'lgan kubning ayqash qirralari o'rtalari orasidagi masofani toping.

A) 3 B) 4 C) 6 D) 9

MATEMATIKA

2016.17.

1. $a = -4$ bo'lsa,

$$\int_a^{a+1} (\ln(\sin^2 2x + \cos^2 2x) + 1)dx$$

aniq integralni hisoblang.

A) $\frac{\ln 2-1}{2}$ B) $2\sqrt{2}$ C) 1 D) $\sqrt{2}$

2. $3^{3x} - 3^x = 702$ tenglamani yeching.

A) 2 B) 4 C) 5 D) 3

3. $1, 2, 3, 4, 5, 6$ raqamlardan faqat bir martadan foydalanib ikkita uch xonali sonlar hosil qilish mumkin, masalan, 645 va 321. Bu raqamlardan ikkita uch xonali sonlar tuzilganda, ular musbat ayirmasining eng kichik qiymati nechaga teeng bo'ladi?

A) 48 B) 47 C) 56 D) 69

4. Akvariumning bo'yi 80 *sm*, eni 60 *sm*, balandligi 40 *sm*. Suv sathi yuqoridan 10 *sm* pastda bo'lishi uchun akvariumga necha litr suv quyish kerak?

A) 288 B) 144 C) 140 D) 72

5. To'g'ri burchakli ABC uchburchak CD balandlik bilan BCD va ACD uchburchaklarga bo'lingan. Shu uchburchaklar yarim perimetrlari mos ravishda 20 va 21 ga teng. ABC uchburchakning yarim perimetrini toping.

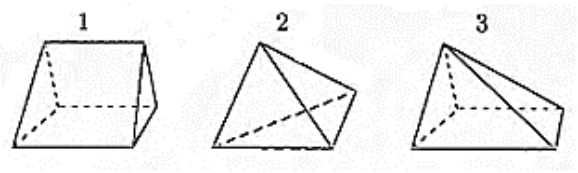
A) $24\sqrt{2}$ B) 26 C) 42 D) 29

6. $y = f(x)$ funksiyada D to'plamda noqat'iy kamayuvchi bo'lsin. D to'plamdan olingan ixtiyoriy a, b elementlar uchun $(a > b)$ quyidagi munosabatlarning qaysi biri o'rinli?

A) $f(a) \le f(b)$ B) $f(b) \le f(a)$ C) $f(a) < f(b)$

D) $f(a) = f(b)$

7. Quyidagi ko'pyoqlarning qayisi birida 4 ta yoq bor?



A) 1, 3 B) 3 C) 1 D) 2

8. Hisoblang : $\sin\frac{\pi}{18}\sin\frac{5\pi}{18}\sin\frac{7\pi}{18}$

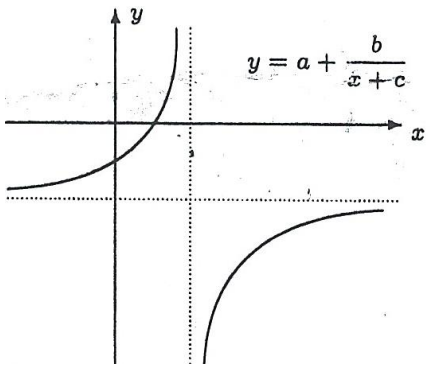
A) $\frac{1}{8}$ B) $\frac{\sqrt{2}}{4}$ C) $\frac{\sqrt{2}}{2}$ D) $\frac{\sqrt{3}}{8}$

9. $y > 0$ bo'lsin. To'rtburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida

quydagicha $A(0;0), B(0;y), C(10;y), D(12;0)$ berilgan. To'rtburchak dioganallarining o'rtalari orasidagi masofani toping.

A) 1 B) $\sqrt{2}$ C) 2 D) *y ga bog'liq*

10. Rasmda $y = a + \frac{b}{x+c}$ funksiya grafigi tasvirlangan. Quydagilardan qaysi biri doim o'rinli?



A) $a^3 - b^3 > 0$ B) $C^2 - b^2 > 0$ C) $a^2 - b^2c > 0$

D) $abc > 0$

11. $\frac{2-x^2-x}{x^2+x} \geq 0$ tengsizlikni yeching.

A) $[-2;-1] \cup (0;1)$ B) $[-2;-1) \cup (0;1)$

C) $(-5;-2] \cup [1;3)$ C) $[-5;-2) \cup (1;3]$

12. $\begin{cases} x^2 + y^2 + xy = 3 \\ x^4 + y^4 = 2 \end{cases}$ tenglamalar sistemasining manfiy sonlardan iborat $(x;y)$ yechimlar juftligi sonini toping.

A) 1 B) 2 C) 0 D) 3

13. $y = \log_5(\sin^2 x + \cos^2 x)$ funksiyaning $x = \frac{1}{2}$ nuqtadagi hosilasini toping.

A) $-\log_5 2$ B) $\log_5 2$ C) 1 D) 0

14. O'zaro teng bo'lmagan x va y sonlari $x^2 + 26y = y^2 + 26x$ tenglikni qanoatlantirsa, $x + y$ ni toping.

A) 26 B) 0 C) 16 D) 24

15. $\sqrt[3]{x-2} - \sqrt[3]{x-4} = -\sqrt[3]{3x-8}$ tenglama nechta butun yechimga ega?

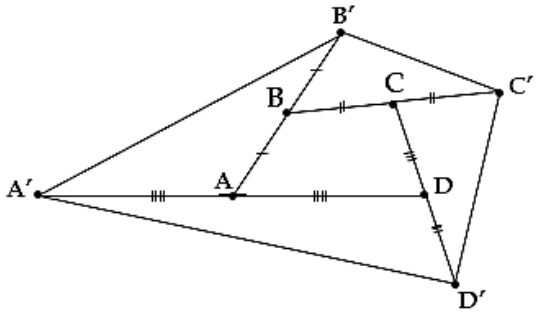
A) 0 B) 2 C) 1 D) 3

16. Hisoblang:

$$\log_{2\sqrt{2}}\left(\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right)\ldots\left(1+\frac{1}{15}\right)\right)$$

A) -3 B) 3 C) 2 D) $\frac{1}{2}$

17. ABCD to'rtburchakning har bir tomoni chizmada ko'rsatilgandek o'z uzunligiga teng uzoqlikda davom ettirilgan. Agar $A'B'C'D'$ to'rtburchak yuzasi 5 ga teng bo'lsa, ABCD to'rtburchak yuzasini toping.



A) 4 B) 2,5 C) 3 D) 1

18. Hisoblang: $1{,}5 + \text{tg}^2\left(\arccos\frac{1}{3}\right)$

A) 8,5 B) 9,5 C) 7 D) -7,5

19. To'g'ri burchakli uchburchak tomonlariga yasalgan kvadratlar yuzalarining yig'indisi 48 ga teng. Gepotenuza uzunligini toping.

A) 10 B) $2\sqrt{6}$ C) $2\sqrt{3}$ D) 12

20. Nechta butun son

$$\log_{0,5}(4^x - 5 * 2^x + 6) \geq -1$$

tengsizlikning yechimi bo'ladi?

A) 1 B) 2 C) *cheksiz ko'p* D) 3

21. Ushbu $f(x) = \frac{2x+1}{x^2+x-2}$ funksiyaning boshlang'ich funksiyasini toping.

A) $\ln(|x-1| \cdot |x+2|) + C$ B) $\frac{2x^2}{(x-1)(x+2)} + C$

C) $\ln|x+2| + C$ D) $\ln(x-1) + C$

22. Velosipedchi tepalikka 12 *km/soat* tezlik bilan chiqdi. Chiqqan yo'li orqali 20 *km/soat* tezlik bilan pastga tushdi va chiqishdagiga qaraganda 16 *min* kamroq vaqt sarfladi. Yo'lning uzunligini (*km*) toping.

A) 12 B)10 C) 8 D) 14

23. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quydagicha berilgan: $A(0;0)$, $B\left(\frac{1}{2};2\right), C(1;0)$. Uchburchak yuzini toping.

A) $\sqrt{3}$ B) 1 C) 2 D) $\sqrt{2}$

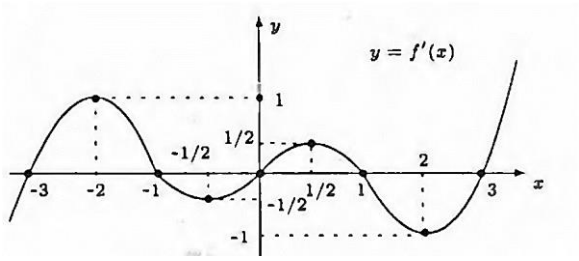
24. Agar barcha x va y lar uchun

$$x^3+4x^2y+axy^2+3xy-bx^cy+7xy^2+dxy+y^2 = x^3+y^2$$

ayniyat bajarilsa, $|a+b+c|(a+b+c+d)$ ni toping $c>1$.

A) 2 B) -1 C) -4 D) -3

25. Rasmda $y=f'(x)$ funksiya grafigi tasvirlangan. $y=f(x)$ funksiyaning $3>x\geq 0$ oraliqdagi o'sish oralig'ini toping.



A) $(0;2)\cup(3;\infty)$ B) $\left(0;\frac{1}{2}\right)\cup(2;\infty)$
C) $(1;3)$ D) $(0;1)$

26. $y=-x^2+6x-1$ funksiyaning simmetriya o'qi koordinatasi va $(5;8)$ nuqta orasida masofani toping.

A) 3 B) 8 C) 2 D) 7

27. R radiusli sferaga muntazam to'rtburchakli piramida ichki chizilgan. Uchidagi yassi burchagi 30° ga teng bo'lsa, piramida yon sirtining yuzini toping.

A) $2R^2$ B) $3R^2\sqrt{3}$ C) $R^2\sqrt{3}$ D) $2R^2\sqrt{3}$

28. $\{x : x\epsilon N, 6\leq x^2\leq 42\}$ to'plamning nechta qism to'plamlari mavjud.

A) 8 B) 32 C) 16 D) 5

29. a va b natural sonlarning eng katta umumiy bo'luvchisi 3 ga teng bo'lsa, $a+3b$ va b sonlarning eng katta umumiy bo'luvchisi nimaga teng?

A) 4 B) *bir qiymatli aniqlab bo'lmaydi* C) 1 D) 3

30. Arifmetik progressiya $n-$hadi $a_n=-\frac{n+1}{5}$ ga teng. Progressiyaning ayirmasini toping.

A) -2 B) $-0{,}2$ C) -1 D) $-0{,}5$

MATEMATIKA

2016.18.

1. $x^{\lg 5}\cdot 5^{-\lg x}=1$ tenglamani yeching.

A) $(0;+\infty)$ B) $\{-1\}\cup(1;+\infty)$ C) $(-1;1)$ D) $(0;1)$

2. $9^{\sin^2 x}-9^{\cos^2 x}=8$ tenglamaning $[0;2\pi]$ kesmadagi ildizlari yig'indisini toping.

A) 270° B) 540° C) 360° D) 630°

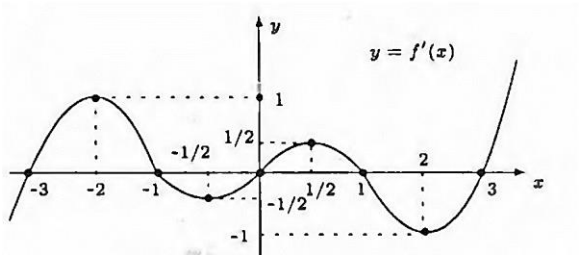
3. $y=-6\sin^2 x+\frac{3}{4}\cos^2 2x+2\frac{1}{4}$ funksiyaning eng kichik butun qiymatining eng katta manfiy butun qiymatiga nisbatini toping.

A) $\frac{1}{3}$ B) 3 C) -1 D) -3

4. C nuqta – AB kesmaning o'rtasi. AC va BC kesmalarda mos ravishda M, N nuqtalar shunday olinganki, AM:MC=CN:NB munosabat bajariladi. Agar AB kesma uzunligi 36 ga teng bo'lsa, MN kesma uzunligini toping.

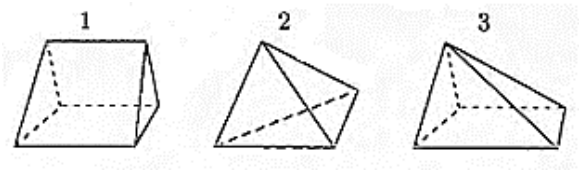
A) 12 B) 9 C) 24 D) 18

5. Rasmda $y=f'(x)$ funksiya grafigi tasvirlangan. $y=f(x)$ funksiya grafigi $x_1=2$ va $x_2=3$ abssisali nuqtalarda o'tkazilgan urinmalar orasidagi o'tkir burchakni aniqlang.



A) $\frac{\pi}{3}$ B) $\frac{\pi}{4}$ C) 0 D) $\frac{\pi}{6}$

6. Quydagi ko'pyoqlardan qaysi birida 5 ta yoq, 9 ta qirra bor?



A) 1 B) 1, 2 C) 2 D) 3

7. $5 \cdot 0{,}2^{\lg x} > 0{,}04^{\lg 2}$ tengsizlikni yeching.

A) $(10; 50)$ B) $(10;50]$ C) $(0;40)$ D) $[1;40]$

8. Velosipedchi tepalikka 12 *km/soat* tezlik bilan chiqdi. Chiqqan yo'li orqali 20 *km/soat* tezlik bilan pastga tushdi va chiqishdagiga qaraganda 16 *min* kamroq vaqt sarfladi. Yo'lning uzunligini (*km*) toping.

A) 14 B)8 C) 12 D) 10

9. Aylanaga tashqi chizilgan ABCD to'rtburchakda AB va CD tomonlar uzunliklari mos ravishda 2 va 3 ga teng bo'lsa AD+BC ni toping.

A) 5 B) 3 C) 6 D) 2

10. Beshta a_1, a_2, a_3, a_4, a_5 tub sonlar ayirmasi 6 ga teng bo'lgan arfmetik progressiyani tashkil qiladi. a_3 ni toping.

A) 19 B) 17 C) 23 D) 11

11. $y = \ln\left(\text{arctg}3x + \text{arcctg}3x - \frac{\pi}{2} + 1\right)$ funksiyaning $x = \frac{1}{2}$ nuqtadagi qiymatini hisoblang.

A) $-\ln 2$ B) 1 C) 0 D) $\ln 2$

12. $y = 4 - x^2$; $y = 0$ chiziqlar bilan chegaralangan shaklning yuzini toping.

A) $8\frac{2}{3}$ B) 8 C) $10\frac{2}{3}$ D) 12

13. Poyezd 5 *minut*da 9 *km* masofani, motosikl 6 *minut*da 9 *km* masofani bosib o'tdi. Motosiklchining tezligi poyezd tezligining necha foizini tashkil etadi.

A)80% B) $81\frac{2}{3}\%$ C) $83\frac{1}{3}\%$ D) $63\frac{1}{3}\%$

14. Agar $\text{ctg}^2\alpha = 1{,}5$ va $\alpha\epsilon\left(0;\frac{\pi}{2}\right)$ bo'lsa, $\cos^2\alpha - \sin^2\alpha$ ni hisoblang.

A) $\frac{1}{5}$ B) $\frac{1}{4}$ C) $\frac{1}{2}$ D) $-\frac{1}{5}$

15. Qirralari 13, 11va 17 bo'lgan parallelopiped qirrasi 1 ga teng bo'lgan kubchalardan tashkil topgan. Parallelopipeddan 1 kubcha qalinligidagi tashqi sirt olib tashlash uchun nechta kubcha olinishi kerak.

A) 944 B) 511 C) 946 D) 513

16. To'g'ri burchakli ABC uchburchak CD balandlik bilan BCD va ACD uchburchaklarga bo'lingan. Shu uchburchaklarga ichki chizilgan aylanalar radiuslari mos ravishda 5 va 12 ga teng. ABC uchburchakka ichki chizilgan aylana radiusini toping.

A) $8\sqrt{2}$ B) 13 C) 14 D) 17

17. $|x^2 - 2x| \le x$ tengsizlikni qanoatlantruvchi tub sonlar yig'indisini toping.

A) 5 B) 10 C) 2 D) 3

18. $2\sqrt{2}$ radiusli sferaga muntazam to'rtburchakli piramida ichki chizilgan. Uchidagi yassi burchagi 45° ga teng bo'lsa, piramida yon sirtining yuzini toping.

A) 28 B) 32 C)$16\sqrt{2}$ D) 36

19. $\{x: x\epsilon N, x^2 < 33\}$ to'plamni nechta usul bilan ikkita kesishmaydigan qism to'plamlarga ajratish mumkin?

A) 16 B) 33 C) 5 D) 32

20. Agar $m = 64$ bo'lsa,

$$\log_7\left(\frac{\sqrt{m}+27}{\sqrt[3]{m}-2\sqrt[6]{m}-15} : \frac{\sqrt[3]{m}-3\sqrt[6]{m}+9}{\sqrt[3]{m}-25}\right)$$

ni hisoblang.

A) $\log_7 2$ B) -1 C) 0 D) 1

21. $y = \text{arctg}x$ funksiya grafigi berilgan bo'lib, uni parallel ko'chirish yordamida $y = \text{arctg}(x + a) + b$ funksiyaning grafigi hosil qilingan. Bunday parallel kochirishda koordinata boshi qanday nuqtaga ko'chadi?

A) $N(-a; b)$ B) $N(a; b)$ C) $N(b; a)$ D) $N(a; -b)$

22. O'zaro teng bo'lmagan x va y sonlari $x^2 + 26y = y^2 + 26x$ tenglikni qanoatlantirsa, $x + y$ ni toping.

A) 0 B) 26 C) 16 D) 24

23. $[4; 100]$ kesmada $2, 3, 5$ va 7 sonlariga bo'linganida qoldiq 1 ga teng bo'ladigan natural sonlar nechta?

A) 3 B) 0 C) 1 D) 2

24. $y > 0$ bo'lsin. To'rtburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quydagicha berilgan: $A(0; 0), B(0; y), C(10; y), D(12; 0)$. To'rtburchak dioganallarining o'rtalari orasidagi masofani toping.

3. A) 2 B) $\sqrt{2}$ C) 1 **4.** D) *y ga bog'liq*

25. $(x; y)$ sonlar jufti $\begin{cases} \frac{4x-3y}{6} + \frac{5y-2x}{3} = 0 \\ \frac{6x+7y}{2} - \frac{4x-3y}{4} = 2 \end{cases}$ sistemaning yechimi bo'lsa, $x^2 - y^2$ ni toping.

A) -1 B) 0 C) 2 D) 1

26. $y = \ln(\text{arctg}2x + \text{arcctg}2x)$ funksiyaning $x = \frac{1}{2}$ nuqtadagi hosilasining qiymatini toping.

A) 0 B) $\ln 2$ C) 1 D) $-\ln 2$

27. $\alpha = 7{,}5°$, $a = (\text{tg}\alpha)^{\text{tg}\alpha}$, $b = (\text{tg}\alpha)^{\text{ctg}\alpha}$, $c = (\text{ctg}\alpha)^{\text{tg}\alpha}$ bo'lsa, quyidagilardan qaysi biri o'rinli?

A) $b > a > c$ *B)* $b > c > a$ *C)* $b > a > c$
D) $c > b > a$

28. Ushbu $f(x) = \frac{x-6}{x-5}$ funksiyaning boshlang'ich funksiyasini toping.

A) $\ln(x-5)^2 + C$ B) $\frac{2x^2}{(x-5)^2} + C$
C) $x - \ln|x-5| + C$ D) $x + \ln|x-5| + C$

29. Ifodani soddalashtring:

$$\frac{1 - \text{tg}^2\frac{\alpha}{2}}{1 + \text{tg}^2\frac{\alpha}{2}} - \frac{1 + \sin 2\alpha}{\sin\alpha + \cos\alpha}, \alpha \in \left(0; \frac{\pi}{2}\right)$$

A) $\sin\alpha$ B) $2\text{tg}\alpha$ C) $\sin\alpha + 1$ D) $-\sin\alpha$

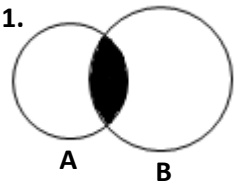
30. Uchburchakning uchlari to'g'ri burchakli dekart koordinatalar sistemasida quyidagicha berilgan: $A(0; 0)$, $B(-1; -2)$, $C(-2; 0)$. Uchburchak yuzini toping.

A) 3 B) $2\sqrt{2}$ C) 2 D) $2\sqrt{3}$

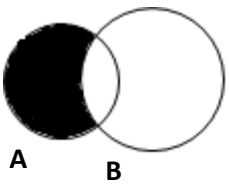
Maxsus test 1

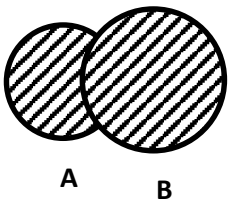
1. Chizmalardan qaysi biri $(A \backslash B) \cup (B \backslash A)$ to'plamni ifodalaydi.

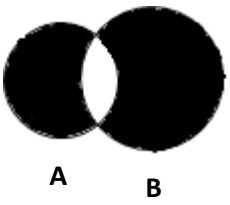
1.



2.







A) 1 B) 2 C) 3 D) 4

2. $713^{823+4n}, n \in \mathbb{N}$ sonni 5 ga bo'lgandagi qoldiqni toping.

A) 3 B) 2 C) 1 D) 4

3. Muntazam 42 burchakning eng katta va eng kichik diagonallari orasidagi burchakni toping.

A) $\frac{19\pi}{42}$ B) $\frac{18\pi}{41}$ C) $\frac{21\pi}{43}$ D) $\frac{\pi}{19}$

4. $f(x) = \sin 2x + 4x, f''(x) = ?$

A) $2\cos 2x + 4$ B) $4\sin 2x$

C) $-4\sin 2x$ D) $-4\sin 2x+4$

5. $\{a_n\}-$ arifmetik progressiyaning dastlabki 43 ta va 17 ta hadining yig'indisi mos ravishda $S_{43}=105$ va $S_{17}=13$ ga teng bo'lsa, $\frac{13}{60}\cdot S_{60}=$?

A) 46 B) 21 C) 17 D) 19

6. Tekislikda $y=1-x^2$ va $y=x^2-7$ chiziqlar bilan chegaralangan shaklning yuzini toping.

A) 21,(6) B) 21 C) 21,(2) D) 21,(3)

7. $\frac{a^3-2a^2+5a+26}{a^3-5a^2+17a-13}$ kasrni qisqartiring.

A) $\frac{a-2}{a+2}$ B) $\frac{a+2}{a-1}$ C) $\frac{a+2}{a-2}$ D) $\frac{1-a}{a+2}$

8. $a^2+b^2=1$ bo'lsa, $a^6+3a^2b^2+b^6$ ni hisoblang.

A) 1 B) 2 C) ab D) $a+b$

9. $\frac{2x-5}{x+3}>3$ tengsizlikni yeching.

A) $(-\infty;-14)\cup(-3;+\infty)$ C) $(-14;3)$

B) $(-14;-3)\cup(-3;+\infty)$ D) $(-14;-3)$

10. Aziz Lutfullaga qarab: "Hozir men senga kartadan fokus ko'rsataman", dedi va 36 talik kartadan Aziz istalgan ikkita kartani tanladi. So'ng Lutfulla 36 ta kartadan ikkita kartani oldi. Olgan kartalari Aziz tanlagan kartalar chiqish ehtimolini toping.

A) $\frac{1}{630}$ B) $\frac{2}{611}$ C) $\frac{1}{611}$ D) $\frac{1}{606}$

11. Aylanaga tashqi chizilgan muntazam oltiburchakning tomoni $2\sqrt{3}$ *sm* bo'lsa, shu aylanaga ichki chizilgan kvadratning yuzini *(sm²)*toping.

A) 16 B) 18 C) 12 D) 20

12. $2+\cfrac{1}{2x-\cfrac{x}{3-\cfrac{3x+6}{2}}}=x$ tenglama nechta yechimga ega.

A) 1 B) 2 C) 3 D) 0

13. $\sin|x|=x^2$ tenglama nechta butun yechimga ega?

A) 1 B) 2 C) 3 D) 0

14. $y=f(x)$ funksiyaning aniqlanish sohasi $[-2;6]$ oraliq bo'lsa, $y=-\frac{1}{2}\cdot f(3-2x)+5$ funksiyaning aniqlanish sohasini toping.

A) $\left[-\frac{3}{2};\frac{5}{2}\right]$ B) $[-9;7]$ C) $[0;4]$ D) $[-15;1]$

15. $y=\log_2(4-x)-\arcsin\frac{x-3}{4}$ funksiyaning aniqlanish sohasini toping.

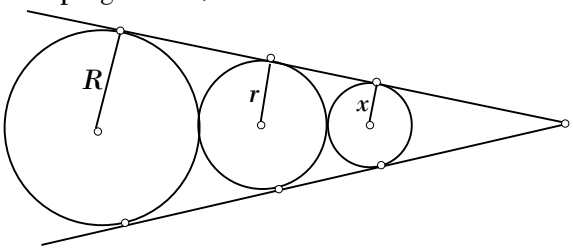
A) $[-1;5]$ B) $(-1;4)$ C) $[-1;4]$ D) $[-1;4)$

16. $f(x)=\text{tg}^2x-\text{ctg}^2x$, $F(x)=$?

A) $tgx-\text{ctg}x$ B) $tgx+\text{ctg}x$

C) $x(tgx-\text{ctg}x)$ D) $x(tgx+\text{ctg}x)$

17. Shaklga ko'ra eng kichik aylananing radiusini toping. $R=5, r=3$.



A) 4/3 B) 1/3 C) 9/5 D) 1

18. $y=\left|1-\sqrt{1-x^2}\right|+\sqrt{1-x^2}+2x^3-3x$ funksiyaning eng katta qiymatini toping.

A) $\sqrt{2}+1$ B) 2 C) $1-\sqrt{2}$ D) 0

19. $\log_2(x-1)-\log_2(x+1)+\log_{\frac{x+1}{x-1}}2>0$

A) $x>3$ B) $x>4$ C) $x<3$ D) $x>6$

20. Quyidagilardan qaysi biri doim o'rinli?

1) $|a-b|<|a+b|$ 2) $|a+b|\le|a|+|b|$

3) $|a-b|\le\big||a|-|b|\big|$ 4) $|a|^2\ge a^2$

A) 1,2,3,4 B) 2,4 C) 2,3 D) 1,2,3

21. Cheksiz kamayuvchi geometrik progressiyaning 2 – hadi 5 – hadidan 8 marta katta. Agar bu geometrik progressiya hadlari yig'indisi 6 ga teng bo'lsa, uning 1 – hadini toping.

A) 3 B) 2 C) 4 D) 6

22. $\begin{cases}x^2-y=23\\ x^2y=50\end{cases}$ tenglamalar sistemasini yeching.

A) $(5;2),(-5;2)$ B) $(-2;5),(-5;-2)$
C) $(4;5),(-4;5)$ C) $(5;4),(-5;4)$

23. $y=|2x-3|-|2x+5|$ funksiyaning qiymatlar sohasini toping.

A) $(-\infty;-8]\cup[8;+\infty)$ B) $[-8;8]$
C) $[8;+\infty)$ D) $(-\infty;-8]$

24. $\sqrt{x^2-x-12}+\sqrt{5x-x^2-4}+\operatorname{tg}\frac{\pi}{2x-4}=1$

tenglamani yeching.

A)1 B) 3 C) 1,3 D) 4

25. $x^2-4x+3+y^2-6y+7=0$ aylanaga $P(7;8)$ nuqtadan urinma aylanaga T nuqtada urinsa, PT ni toping?

A)$\sqrt{45}$ B) $\sqrt{46}$ C) $\sqrt{47}$ D) $\sqrt{48}$

26. Tenglamani yeching:

$$|x^2-4x+3|+|3-2x-x^2|=|6-6x|$$

A) [-3;3] B) {-3;1;3}
C) {-4;3} D) {1;2;-3;3}

27. Hisoblang: $\sqrt[3]{0.5}+\sqrt[3]{4}-\sqrt[3]{13.5}$

A) $\sqrt[3]{2}$ B) 0 C) $\sqrt[3]{5}$ D) $-\sqrt[3]{5}$

28. Teploxod ikki pristan orasidagi masofani daryo oqimi bo'yicha 7 soat, oqimga qarshi 9 soatda o'tadi. Agar oqimning tezligi 2 $km/soat$ bo'lsa, pristanlar orasidagi masofa necha km?

A) 130 B) 126 C) 120 D) 128

29. Hisoblang:

$$\lim_{x\to1}\frac{\sqrt{2x+1}-\sqrt{3x}}{\sqrt{x+1}-\sqrt{2x}}$$

A) ∞ B) 0 C) $\sqrt{\frac{2}{3}}$ D) $\frac{1}{\sqrt{6}}$

30. Tetraedrning yon qirralari a,b,c ga teng bo'lib, uchidagi barcha tekis burchaklari 90^o ga teng. Tetraedrga kub shunday ichki chizilganki kubning bitta uchi tetraedrning uchida, unga qarama qarshi uchi esa tetraedrning asosida yotadi. Kubning qirrasini toping.

A) $\frac{abc}{ab+ac+bc}$ B) $\frac{ab+ac+bc}{a+b+c}$

C) $\frac{ab+ac+bc}{abc}$ D) $\frac{a+b+c}{ab+ac+bc}$

	0	1	2	3	4	5	6	7	8	9
0		D	B	A	C	A	D	B	A	D
1	A	B	B	A	A	D	B	C	A	B
2	B	A	A	B	D	C	A	B	B	C
3	A									

Maxsus test 2

1. $\cos\left(\frac{1}{\sqrt{x^2-4}}+\frac{\pi}{3}\right)>-\frac{\pi}{e}$ tengsizlikni yeching.

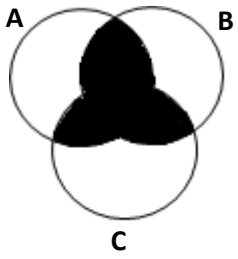
A) $\mathbb{R}$ B) $\emptyset$ C) $(-\infty;-2)\cup(2;+\infty)$ D) $(-\infty;-2]\cup[2;+\infty)$

2. $\mathcal{A}=\{x\in\mathbb{Z}|1<\log_2(x-3)<4\}$ to'plamning nechta ikki elementli qism – to'plami bor?

A) 78 B) 12 C) 24 B) 76

3. Quyidagi bo'yalgan sohalardan qaysi biri $A\cap B\cap C$ to'plamni ifodalaydi:

1.



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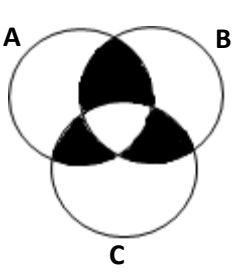

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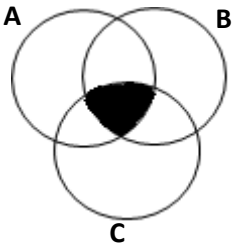

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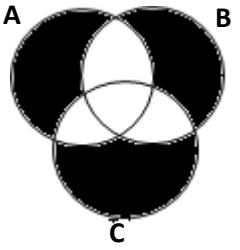


A) 2 B) 3 C) 4 D) 1

4. $y = f(x)$ funksiyaning eng kichik musbat davri $T_0 = \sqrt{2}$ ga teng. $y = \sin f(x)$ funksiyaning davrini toping.

A) $\sqrt{2}$ B) 2π C) $\sqrt{2}\pi$
D) *aniqlab bo'lmaydi*

5. 125 sonining barcha butun bo'luvchilari ko'paytmasini toping.

A) 125^4 B) 125^2 C) 25^4 D) -125^4

6. Quyidagi tasdiqlardan nechtasi to'g'ri?

1) Juft va toq funksiyalarning yig'indisi toq funksiya bo'ladi.

2) Har qanday funksiyani juft va toq funksiyalarning yig'indisi ko'rinishida yozish mumkin.

3) Juft va toq funksiyalarning aniqlanish sohasi koordinata boshiga nisbatan simmetrik bo'ladi.

4) Davriy funksiyalar juft funksiya bo'ladi.

A) 4 B) 2 C) 1 D) 3

7. Rasmda tasvirlangan ko'pyoqning D va B_1 uchlari orasidagi masofani toping. Bunda ko'pyoqning barcha ikkiyoqli burchakli to'g'ri burchakli.

A) 21 B) 20 C) 17 D) 19

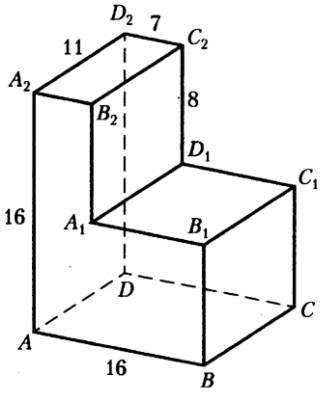
8. Ifodaning qiymatini toping:

$$\sqrt{32}\cos^2\frac{\pi}{8} - \sqrt{8}$$

A) 3 B) 0 C) 2 D) 1

9. $y = \big||x-2|-3\big|$ funksiyaning $x = 1$ nuqtadagi hosilasini toping.

A) *mavjud emas*
B) 1 C) -1
D) 0



10. Ko'phadning o'zgaruvchili hadlari oldidagi koeffitsiyentlari yig'indisini toping.

$$(x+y+z)^6 - (2x-y+1)^3 + (2z-x+2)^3$$

A) 748 B) 741 C) 749 D) 740

11. Hisoblang:

$$1+\frac{1}{1+2}+\frac{1}{1+2+3}+\frac{1}{1+2+3+4}+\ldots+\frac{1}{1+2+3+\ldots+100}$$

A) $\frac{200}{101}$ B) $\frac{199}{101}$ C) $\frac{201}{101}$ D) 2

12. Hisoblang: $2\sqrt{13}\cos\left(\text{arctg}\frac{2}{3}\right)$

A) -6 B) 6 C) $\frac{2}{\sqrt{5}}$ D) $2\sqrt{5}$

13. $y = f(x)$ funksiyaning aniqlanish sohasi $\mathcal{D}(f) = [-3;6]$ oraliq. $y = f(x)$ funksiya grafigini Ox o'qdan 2 marta, Oy o'qdan 3 marta cho'zish orqali hosil qilingan funksiyaning aniqlanish sohasini toping.

A) $[-9;18]$ B) $[-1;2]$ C) $[-6;12]$ D) $\left[-\frac{3}{2};3\right]$

14. $(x^2-1)(x+3)(x+5) = 20$ tenglamani yeching.

A) $\sqrt{11}-2$ B) $2+\sqrt{11}$ C) $\pm\sqrt{11}-2$
D) $\pm\sqrt{11}+22$

15. Soat millari 13:47 ni ko'rsatmoqda. Soat va minut millari orasidagi burchakni toping.

A) 228,5° B) 228° C) 144° D) 144,5°

16. Quyidagi funksiyalardan qaysi birining grafigi koordinata boshiga nisbatan $y = \text{arcctg}(3x-8)$ funksiya grafigiga simmetrik bo'ladi?

A) $y = \text{ctg}(3x-8)$
B) $y = -\text{arcctg}(3x+8)$
C) $y = -\text{arcctg}(3x+8)$
D) $y = \text{arcctg}(3x+8) - \pi$

17. Ifodani soddalashtiring:

$$\frac{\frac{1}{a}-\frac{1}{b+c}}{\frac{1}{a}+\frac{1}{b+c}}\left(1+\frac{b^2+c^2-a^2}{2bc}\right):\frac{a-b-c}{abc}$$

A) $\frac{a(a+b+c)}{2}$ B) $\frac{a-b-c}{2}$

C) $a\cdot(a-b-c)$ D) $\frac{a(a-b-c)}{2}$

18. Quyida keltirilgan sonlardan qaysi biri $[4;5]$ oraliqqa tegishli?

A) $\left(\frac{2\sqrt{3}}{3}\right)^2$ B) $\frac{5\sqrt{6}}{\sqrt{75}}$ C) $\frac{5\sqrt{3}}{\sqrt{15}}$ D) $2\sqrt{5}$

19. Uchburchakning bir tomonida olingan nuqta orqali uchburchakning qolgan ikki tomoniga parallel chiziqlar o'tkazilgan bo'lib, bu chiziqlar uchburchakni uch qismga – bitta parallelogramm va ikkita uchburchakka ajratadi. Uchburchaklarning yuzasi 3 va 12 bo'lsa, parallelogrammning yuzasini toping.

A) 36 B) 12 C) 6 D) $6\sqrt{3}$

20. Diametri 4 ga teng bo'lgan aylanda AB diametr va CD vatar o'tkazilgan bo'lib, ular E nuqtada kesishadi. $\angle ABC = 60°, \angle BCE = 8°$ ekani ma'lum bo'lsa, CE ning uzunligini toping.

A) $\frac{\sqrt{3}}{\sin 68^\circ}$ B) $\frac{\sqrt{2}}{\sin 68^\circ}$ C) $\frac{\sqrt{3}}{\cos 68^\circ}$ D) $\frac{\sqrt{2}}{\cos 68^\circ}$

21. ABCD trapetsiyaning AD asosidagi o'tkir burchagidan o'tuvchi AC diagonal uni ikkita o'xshash uchburchaklarga ajratadi. AD asosning uzunligi a ga, BC asosning uzunligi b ga teng bo'lsa, AC diagonalning uzunligini hisoblang.

A) $\sqrt{ab}$ B) $\sqrt{\frac{a^2+b^2}{2}}$ C) $\frac{ab}{a+b}$ D) $\frac{a+b}{2}$

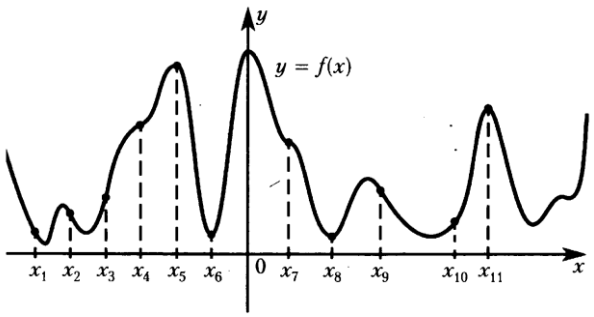
22. Muntazam 101 burchakning eng katta va eng kichik diagonallari orasidagi kichik burchakni toping.

A) $\frac{48\pi}{101}$ B) $\frac{97\pi}{202}$ C) $\frac{48\pi}{103}$ D) $\frac{97\pi}{101}$

23. Piramidaning asosi – uchburchak. Uning ikkita tomoni 3 va $\sqrt{3}$ ga teng hamda ular orasidagi burchak 30° dir. Har bir yon qirra esa $\sqrt{51}$ ga teng. Piramidaning hajmini toping.

A) 5 B) 3 C) 7 D) 6

24. Chizmada $y = f(x)$ funksiya grafigi tasvirlangan. Absissa o'qida o'nbitta $x_1, x_2, x_3, \dots, x_{11}$ nuqta berilgan. Bu nuqtalardan nechtasida funksiya hosilasi musbat bo'ladi?



A) 3 B) 4 C) 2 D) 5

25. Agar $\left(9x-\frac{1}{\sqrt{3x}}\right)^m$ binom yoyilmasi uchinchi hadining binomial koeffitsiyenti 105 ga teng bo'lsa, shu yoyilmaning o'nuchinchi hadi topilsin.

A) $455x^{-3}$ B) $-455x^{-3}$ C) $-455x^3$ D) $455x^3$

26. Quyidagi ma'lumotlarga ko'ra butun musbat son topilsin: agar uning o'ng tomoniga 5 raqami

yozilsa, izlangan sondan 3 ta ortiq songa qoldiqsiz bo'linadigan va bo'linmada bo'luvchidan 16 ta kam chiqadigan son hosil bo'ladi.

A) 22 B) 24 C) 27 D) 19

27. Tenglama nechta yechimga ega:

$$\frac{x-4}{\sqrt{x}+2} = x-8$$

A) 0 B) 1 C) 2 D) 3

28. Tenglamani yeching.

$$8\text{tg}^2\frac{x}{2} = 1 + \frac{1}{\cos x}$$

A) $\pm\arccos\frac{1}{3} + 2\pi n, n \in \mathbb{N}$

B) $\pm\arccos\frac{1}{3} + 2\pi n, n \in \mathbb{Z}$

C) $\pm\arccos\frac{1}{3} + \pi n, n \in \mathbb{N}$

D) $\pm\arccos\frac{1}{3} + \pi n, n \in \mathbb{Z}$

29. Limitni hisoblang:

$$\lim_{x\to+\infty}\left(\sqrt{(x+1)(x+2)} - x\right)$$

A) $\frac{3}{2}$ B) 0 C) ∞ D) 1

30. Xaltada 2 ta ko'k, 3 ta qizil va 4 ta yashil sharcha bor. Xaltadan olingan 2 ta sharchaning har xil rangda bo'lish ehtimolini toping.

A) 5/18 B) 1/3 C) 5/6 D) 13/18

	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
0		**C**	**A**	**B**	**A**	**A**	**C**	**A**	**C**	**B**
1	**B**	**A**	**B**	**A**	**C**	**A**	**D**	**D**	**D**	**B**
2	**A**	**A**	**A**	**B**	**A**	**A**	**A**	**B**	**B**	**A**
3	**D**	**A**	**A**	**A**	**B**	**B**	**A**			

Maxsus test 3

1. Agar $b^c = 49, b^a = 7$ va $c^a = 8$ bo'lsa, c^c ni toping.

A) 60 B) 58 C) 64 D) 27

2. Tenglamalar sistemasi nechta yechimga ega?

$$\begin{cases} |y| = |x^2 - 1| \\ y^2 = x - 2 \end{cases}$$

A) 1 B) 2 C) 0 D) 3

3. $|x-3|\cdot|x+1| = 5$ tenglamaning ildizlari yig'indisini toping.

A) 3 B) -3 C) -2 D) 2

4. $27^{2016^{2017}}$ sonining oxirgi raqamini toping.

A) 1 B) 7 C) 9 D) 3

5. $a = \sqrt[3]{10} + \sqrt[3]{12}$ va $b = 2\sqrt[3]{11}$ bo'lsa, quyidagilardan to'g'risini toping.

A) $a > b$ B) $b \geq a$

C) $a - b = 1$ D) $b^3 = a^3 + 1$

6. $\left[\left(\frac{1}{a} + \frac{1}{b+c}\right) : \left(\frac{1}{a} - \frac{1}{b+c}\right)\right] : \left(1 + \frac{b^2+c^2-a^2}{2bc}\right)$ ifodani soddalashtiring.

A) $\frac{1}{2bc}$ B) $\frac{a+b}{2bc}$ C) $\frac{2bc}{a+c-b}$ D) $\frac{2bc}{(b+c-a)^2}$

7. Qutida a ta oq va b ta qora shar bor. Qutidan olingan bir sharning oq rangda ekanligini bilgan holda boshqa bir shar olindi. Olingan sharning oq bo'lish ehtimoli topilsin.

A) $\frac{a}{a+b}$ B) $\frac{a-1}{a+b-1}$ C) $\frac{a-1}{a+b}$ D) $\frac{a}{a+b-1}$

8. Quyidagi tenglamani qanoatlantiruvchi nuqtalar orasidagi masofa topilsin.

$$\log_8(x^2+1)^3 - \log_2 xy + \log_{\sqrt{2}}\sqrt{y^2+4} = 3$$

A) 2 B) 5 C) $2\sqrt{5}$ D) $\sqrt{3}$

9. Aniq integralni hisoblang:

$$\int_1^5 [x]^2 dx$$

bunda $[x] - x$ sonining butun qismi.

A) $40\frac{1}{2}$ B) 35 C) $41\frac{1}{3}$ D) 30

10. $y = \log_2 f(x)$ funksiyaning aniqlanish sohasi $[-3;6]$ oraliqdan iborat. $y = \log_2 f(x)$ funksiya grafigini Ox o'qidan 3 marta cho'zish, so'ngra Oy o'qi bo'yicha 4 birlik yuqoriga siljitishdan hosil bo'lgan funksiyaning aniqlanish sohasini toping

A)$[-3;6]$ B)$[-1;2]$ C) $[-9;18]$ D) $[1;10]$

11. m ning qanday qiymatlarida

$$(m-1)x^2 + 2mx + 3m - 2$$

kvadrat uchhadni to'la kvadrat shaklida tasvirlash mumkin.

A) $2;\frac{1}{2}$ B) -2 C) $\frac{1}{2}$ D) 2

12. Quyidagi to'plamlardan qaysilari bo'sh to'plam?

1) $\{x \in \mathbb{N} | x^3 + 1 = 0\}$

2) $\{x \in \mathbb{R} | x^2 + x + 7 = -|x|\}$

3) $\{x \in \mathbb{N} | x^2 - 1 < 0\}$

4) $\left\{x \in \mathbb{N} | x^2 - \frac{9}{4} \le 0\right\}$

5) $\{x \in \mathbb{R} | x^2 + x + 1 < 0\}$

A) 1,3,4 B) 2,3,5 C) 1,2,3,5 D) faqat 2

13. a ning qanday musbat qiymatida

$$\begin{cases}(x+4)^2 + (y-4)^2 = 9 \\ (x+1)^2 + y^2 = a^2\end{cases}$$

tenglamalar sistemasi yagona yechimga ega?

A) 2 B) 3 C) 5 D) 1,2

14. $f(x) = \frac{x^2 - ax + 1}{x^2 + x + 1}$ funksiyaning qiymatlar to'plami $(-3; 3)$ interval bo'ladigan a ning barcha qiymatlarini toping.

A) $a \in (-2; 1)$ B) $a \in [-2; 1)$

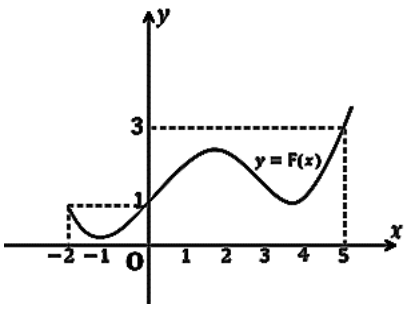
C) $a \in (-5; 1)$ D) $a \in (-2; 2)$

15. $\{2016 < \sqrt{n} \le 2017, n \in \mathbb{N}\}$ to'plamning 4031 ta elementli qism to'plamlari sonini aniqlang.

A) $2016 \cdot 4031$ ta B) $2014 \cdot 4031$ ta

C) $2016 \cdot 4033$ ta D) $2016 \cdot 4031$ ta

16. Quyida $y = f(x)$ funksiyaning boshlang'ich funksiyasi $F(x)$ ning grafigi tasvirlangan. Shunga ko'ra $\int_{-2}^{5} f(x)dx$ hisoblansin.



A) 2 B) 3 C) 5 D) 1,2

17. Agar $f(x)$ –juft funksiya bo'lsa, va u

$$(x^2 - 4)f(2 - x) + \frac{f(x^2 - 2)}{x + 1} = 1$$

shartni qanoatlantirsa, $f(2)$ ni toping.

A) $\frac{2}{3}$ B) $-\frac{2}{3}$ C) 1 D) $-\frac{1}{3}$

18. Anvar bir ishni a kunda, Obid shu ishni b kunda, Odil esa shu ishni c kunda bajaradi. Agar ular birgalikda bu ishni 8 kunda bajarsa va $a > b > c$ bo'lsa, quyidagilardan qaysi biri a bo'lishi mumkin?

A) 25 B) 24 C) 23 D) 22

19. Agar $a = \sqrt[3]{4} + \sqrt[3]{2} + 1$ bo'lsa, $\frac{1}{a^3} + \frac{3}{a^2} + \frac{3}{a}$ ni toping.

A) 2 B) $\sqrt[3]{2} + 1$ C) 1 D) $1 - \sqrt[3]{2}$

20. m parametr bo'lsa, $y = x^2 - mx + 1$ parabolalar uchlarining geometrik o'rni quyidagilardan qaysi biri bilan ifodalanadi?

A) $x^2 + y^2 = 1$ B) $y = -x^2 + 1$

C) $x - y = -1$ D) $x + y = 1$

21. $2\arcsin\frac{x}{2} + 2\arccos x = \pi$ tenglamaning ildizi 5 dan qancha kam?

A) 0,5 B) 4,5 C) 4 D) 5

22. To'g'ri prizmaning asosi katetlari 20 *sm* va 21 *sm* bo'lgan to'g'ri burchakli uchburchakdan iborat. Gepotenuzaning o'rtasi orqali unga perpundikulyar ravishda tekislik o'tkazilgan. Agar prizmaning yon qirrasi 20 *sm* bo'lsa, kesimni yuzini toping.

A) 290 B) 420 C) 400 D) 220

23. ABC uchburchak aylanaga ichki chizilgan va AM mediananing davomi aylanani K nuqtada kesadi. Agar $AM = 18, MK = 8$ va $BK = 10$ bo'lsa, AC tamon uzunligini toping.

A) 15 B) 12 C) 10,5 D) 19,2

24. ABCD trapetsiyaning asoslari $AD = 9$ va $BC = 4$. Uning B, C va D uchlari aylanada bo'lib, AB tamon B nuqtada aylanaga urinma bo'lsa, uning BD dioganali uzunligi toping.

A) $\sqrt{65}$ B) 6 C) $2\sqrt{5}$ D) 3

25. ABC uchburchakning B uchi va AM mediananing o'rtasi orqali l to'g'ri chiziq o'tkazilgan, bu chiziq AC tamonni F nuqtada kesadi. Agar D nuqta AM ning o'rtasi bo'lsa, BD: DF ni toping.

A) 4:3 B) 3:1 C) 2:1 D) 5:4

26. Koordinata o'qlarini parallel ko'chirish natijasida $(2; 3)$ nuqta $(1; 0)$ nuqtaga o'tadi. Koordinata boshi qaysi nuqtaga o'tadi?

A) $(-1; -3)$ B) $(0; -3)$ C) $(1; 3)$ D) $(-2; 1)$

27. ABCD to'g'ri to'rtburchakda $AB = 2$, $\angle BDA = 30°$ bo'lsa, $\overline{DB}$ va $\overline{CD}$ vektorlarning ko'paytmasini toping.

A) 4 B) 4 C) -4 D) $2\sqrt{3}$

28. Uchburchak tamonlari $2x - 5y - 2 = 0$, $x + y - 8 = 0$ va $5x - 2y - 5 = 0$ tenglamalar bilan berilgan bo'lsa, uning medianalari kesishish nuqtasini toping.

A) $\left(\frac{5}{3}; 4\right)$ B) $\left(\frac{5}{3}; \frac{7}{3}\right)$ C) $\left(\frac{10}{3}; \frac{7}{3}\right)$ D) $\left(\frac{5}{3}; \frac{7}{2}\right)$

29. ABCD tetraedrning qirralari $\sqrt{6}$ ga teng bo'lsa, uning A uchidan BDC tekislikkacha bo'lgan masofa topilsin.

A) $\sqrt{2}$ B) 2 C) $\sqrt{3}$ D) $2\sqrt{2}$

30. Ikki yoqli burchakning yoqlarida yotgan A va B nuqtalardan burchakning qirrasigacha AA_1 va BB_1 perpendikulyarlar tushirilgan. Agar $AA_1 = 3$ $BB_1 = 4, A_1B_1 = 2\sqrt{3}$ va ikki yoqli burchak 60° ga teng bo'lsa, AB kesmaning uzunligini toping.

A) $2-\sqrt{3}$ B) $3\sqrt{2}$ C) 5 D) 1

	0	1	2	3	4	5	6	7	8	9
0		C	C	D	A	B	D	B	C	D
1	A	D	C	A	C	C	A	D	A	C
2	B	D	A	A	B	B	A	C	C	B
3	C	A	C	B	C	D	B			

Maxsus test 4

1. Hisoblang:

$$\frac{\frac{1}{2}}{1+\frac{1}{2}}+\frac{\frac{1}{3}}{\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)}+\frac{\frac{1}{4}}{\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right)}+\ldots+$$

$$+\frac{\frac{1}{8}}{\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right)..\left(1+\frac{1}{8}\right)}$$

A) 0,(7) B) 0,(3) C) 0,(1) D) 1,(7)

2. 7^{77} ni 4 ga bo'lgandagi qoldiqni toping.

A) 1 B) 2 C) 3 D) 0

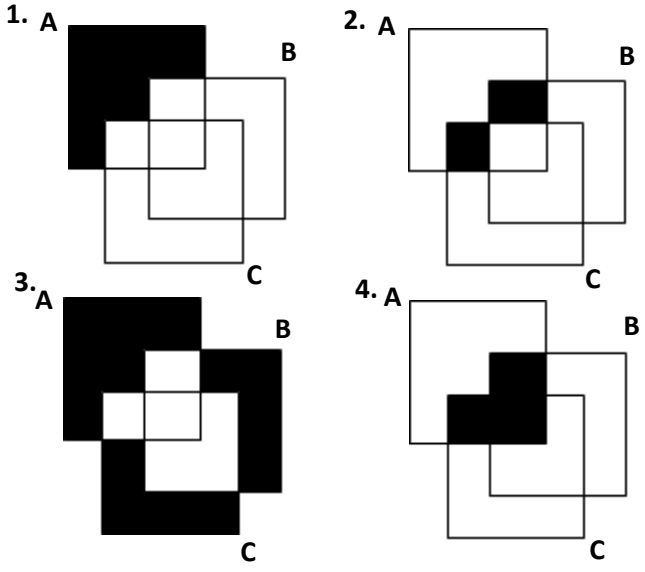
3. Agar $a=\frac{\sqrt{2}}{2}, b=\frac{1}{\sqrt[3]{2}}$ bo'lsa,

$$\left[a^{-\frac{3}{2}}b\left(ab^{-2}\right)^{-\frac{1}{2}}\left(a^{-1}\right)^{-\frac{2}{3}}\right]^3$$

ifodaning qiymatini toping.

A) $\sqrt{2}$ B) 1 C) $\frac{1}{\sqrt{2}}$ D) $\sqrt[3]{2}$

4. Quyida bo'yalgan sohalardan qaysi biri $(A\backslash B)\backslash C$ to'plamni ifodalaydi?



A) 3 B) 2 C) 1 D) 4

5. $y=\sqrt{5-\sqrt{4x^2-20x+25}}-\sqrt{|x|(2x-10)}$ funksiyaning aniqlanish sohasiga tegishli bo'lgan barcha butun sonlarning yig'indisini toping.

A) 5 B) 10 C) 0 D) 1

6. Funksiyaning davrini toping:

$$y=4\left\{\frac{1}{2}\cos^2\left(-\frac{1}{2}x+3\right)+4\right\}+1$$

A) 2 B) 4π C) $\frac{1}{\pi}$ D) 2π

7. $t^3+t+1=0$ bo'lsa, t^7 ni toping.

A) $2t^2-1$ B) $2t^2+1$ C) t^2+t D) t^2

8. Qadimgi noyob mollar magazini ikki dona buyumni 225 so'mga olib, 40% foydasiga sotdi. Agar mollarning biridan 25%, ikkinchisidan 50% foyda qilgan bo'lsa, magazin har qaysi molni necha so'mga olgan?

A) 95, 130 B) 90, 135 C) 80, 145 D) 85, 140

9. Rombning o'tmas burchagi uchidan uning tomonlariga perpendikulyar o'tkazilgan. Har bir

perpendikulyarning uzunligi 5 ga teng, ularning asoslari orasidagi masofa 8 ga teng. Rombning yuzi topilsin.

A) $26\frac{1}{24}$ B) $25\frac{1}{24}$ C) $24\frac{1}{26}$ D) $24\frac{1}{25}$

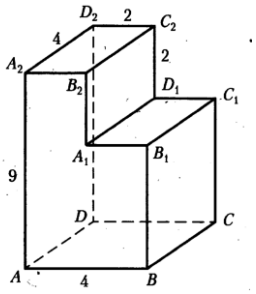
10. Tenglamaning ildizlari ko'paytmasini toping:

$$\log_x\left(9x^2\right)\cdot\log_3^2 x = 4$$

A) 1/3 B) 3 C) 1 D) 1/9

11. Kubning qo'shni yoqlarining ayqash diagonallari orasidagi masofani toping. Bunda kubning qirrasi $a\sqrt{3}$ ga teng.

A) $\frac{a}{3}$ B) $\frac{a}{2}$ C) a D) $\frac{a\sqrt{3}}{3}$



12. Hisoblang:

$$\sin\left[\frac{1}{2}\operatorname{arcctg}\left(-\frac{3}{4}\right)\right]$$

A) $\frac{2}{\sqrt{5}}$ B) $-\frac{2}{\sqrt{5}}$ C) 1 D) -1

13. Quyidagi funksiyalardan qaysi birining grafigi $y=-x$ to'g'ri chiziqqa nisbatan $y=f\left(\frac{1}{2}x\right)$ funksiyaning grafigiga simmetrik bo'ladi?

A) $y=-f\left(-\frac{x}{2}\right)$ B) $x=-f\left(-\frac{y}{2}\right)$ C) $x=f\left(\frac{y}{2}\right)$ D) $x=f\left(-\frac{y}{2}\right)$

14. Qirralari a teng bo'lgan ikkita kub bir – birining ichida joylashgan. Ulardan biri qarama – qarshi yon qirralaridan o'tuvchi tekislikka nisbatan 45° ga burildi. Hosil bo'lgan ko'pyoqning hajmini toping.

A) $a^3\left(4-2\sqrt{2}\right)$ B) $a^3\left(3-2\sqrt{2}\right)$ C) $a^3\left(4-\sqrt{2}\right)$ D) $a^3\left(3-\sqrt{2}\right)$

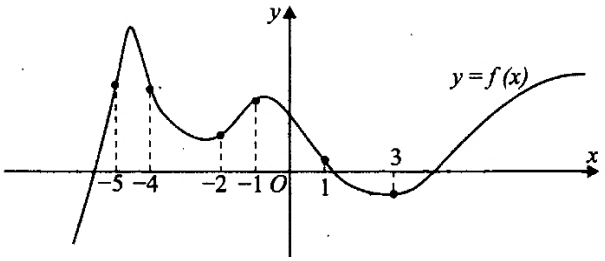
15. Rasmda tasvirlangan ko'pyoqning D_2 va B_1 uchlari orasidagi masofani toping. Bunda ko'pyoqning barcha ikki yoqli burchaklari to'g'ri burchakli.

A) 7 B) 8 C) 6 D) 9

16. $y=\sqrt[x]{\cos\sqrt{x}}$, $y'\left(4\pi^2\right)=?$

A) 0 B) $2\pi\sqrt{\pi}$ C) 1 D) -1

17. Rasmda $y=f(x)$ funksiyaning grafigi tasvirlangan. Keltirilgan $-5,-4,-2,-1,\ 1,\ 3$ nuqtalardan qaysi birida funksiyaning hosilasi eng katta bo'ladi?



A) -5 B) -2 C) 3 D) -1

18. $y=4\sqrt{2}\cos x+4x-\pi-1$ funksiyaning $\left[0;\frac{\pi}{2}\right]$ kesmadagi eng katta qiymatini toping.

A) -3 B) 3 C) π D) 1

19. ABCD to'rtburchakda $\angle CAB=\angle ABD=30°, \angle CBD=25°, \angle CAD=35°$ bo'lsa, $\angle ACD=$?.

A) 20° B) 25° C) 30° D) 35°

20. Tengsizlikni yeching:

$$\frac{19-x^2}{3+4x+x^2}\geq 1$$

A) $[-4;-3)\cup(-1;2]$ B) $(-1;2]$ C) $[-4;-3)$ D) $[-4;2]$

21. $\cos 7x-\sqrt{3}\sin 7x=-\sqrt{2}$ tenglama $\left(0{,}4\pi;\frac{6\pi}{7}\right)$ oraliqda nechta yechimga ega?

A) 3 B) 4 C) 2 D) 5

22. $(a+b)^n$ yoyilmaning barcha koeffitsiyentlari yig'indisi 4096 ga teng bo'lsa, uning eng katta koeffitsiyentini toping.

A) 920 B) 924 C) 912 D) 900

23. Hisoblang:

$$\lim_{x\to 4}\frac{x+\sqrt{x}-6}{x-5\sqrt{x}+6}$$

A) 5 B) ∞ C) -5 D) 0

24. $2-\dfrac{1}{2x-\dfrac{x}{3-\dfrac{3x+6}{2}}}=2x$ tenglama nechta yechimga ega?

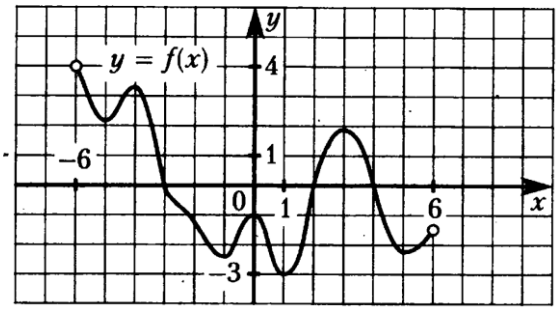
A) 2 B) 1 C) 3 D) 0

25. $|y|=|2^x-1|, x=-1$ va $x=1$ chiziqlar bilan chegaralangan shaklning yuzini toping.

A) $\frac{1}{\ln 2}$ B) $\frac{1}{2\ln 2}$ C) $2\ln 2$ D) $\ln 2$

26. Arifmetik progressiyada $a_1+a_{11}+a_{21}=45$ va $a_{3n-4}+a_{8-3n}=18$ bo'lsa, S_{12} ni toping.

A) 156 B) 169 C) 144 D) *aniqlab bo'lmaydi*



27. Quyidagilardan qaysi biri doim musbat: $(0<a<1, b>1, c>1)$

A) $\log_a b\cdot\log_b c$ B) $\log_b c\cdot\log_c a$

C) $\log_a c\cdot\log_c\frac{1}{b}$ D) $\log_a c\cdot\log_b\frac{1}{c}\cdot\log_c a$

28. $y=a\log_3(kx+b)+d$ funksiya o'suvchi bo'lsa, quyidagilardan qaysi biri doim o'rinli?

A) $ak<0$ B) $ak>0$ C) $ab+k>0$ D) $k>0$

29. $P(x)$ ko'phadning koeffisiyentlari yig'indisi 12 ga teng bo'lsa, $t^2-P(1)t=-11$ tenglama nechta yechimga ega?

A) 1 B) *aniqlab bo'lmaydi* C) 2 D) 0

30. $mx^2+2(m-1)x+m-5=0, m\neq 0$ tenglamaning ildizlari x_1, x_2 bo'lsa, m ning qanday qiymatlarida $x_1<x_2<2$ bo'ladi?

A) $\left(-\frac{1}{3};0\right)\cup(1;+\infty)$ B) $\left(-\frac{1}{3};0\right)$ C) $(1;+\infty)$ D) $\left(-\frac{1}{3};+\infty\right)$

	0	1	2	3	4	5	6	7	8	9
0		**A**	**C**	**B**	**C**	**A**	**D**	**A**	**B**	**A**
1	**A**	**C**	**A**	**B**	**A**	**C**	**A**	**A**	**B**	**C**
2	**A**	**A**	**B**	**C**	**A**	**A**	**C**	**C**	**B**	**C**
3	**A**									

Maxsus test 5

1. Yon tomoni a ga teng bo'lgan ikkita teng yonli to'g'ri burchakli uchburchaklar ustma – ust qo'yildi. Shundan so'ng uchburchaklardan biri to'g'ri burchagining uchi atrofida 45° ga burildi. Hosil bo'lgan shaklning perimetrini toping.

A) $a(2+2\sqrt{2})$ B) $a(3+2\sqrt{2})$ C) $3a(1+\sqrt{2})$ D) $a(2+\sqrt{2})$

2. $\mathcal{A}=\{x\in\mathbb{N}:\log_2(x-2)<5\}$ to'plamning nechta uchta elementli qism to'plami mavjud?

A) 4494 B) 5456 C) 4495 D) 5495

3. Qirrasi a ga teng bo'lgan kub qo'shni yoqlarining ayqash diagonallari orasidagi masofani toping.

A) $\frac{a\sqrt{3}}{2}$ B) $\frac{a}{\sqrt{3}}$ C) $\frac{a\sqrt{2}}{2}$ D) $\frac{a\sqrt{3}}{4}$

4. Chizmada $(-6;6)$ oraliqda aniqlangan $y=f(x)$ funksiyaning grafigi tasvirlangan. Unga ko'ra $f'(x)=0$ tenglama $[-5{,}5;1{,}5]$ kesmada nechta yechimga egaligini aniqlang.

A) 7 B) 5 C) 6 D) 3

5. $2x^2-(a+1)x+a+3=0$ tenglamaning ildizlari orasidagi masofa 1 ga teng bo'lsa, a ni toping.

A) 9, −3 B) 9, −2 C) 3, 5 D) 2, 3

6. Tenglamalar sistemasi nechta yechimga ega?

$$\begin{cases} x+xy+y=11 \\ x^2y+xy^2=30 \end{cases}$$

A) 4 B) 2 C) 3 D) 1

7. Tengsizlikni yeching:

$$\frac{\log_2(x+5)}{2^{x+2}-4^x-3} \le \log_2(x+5)$$

A) $[-4;0] \cup (\log_2 3;+\infty)$
B) $[-4;1) \cup (\log_2 3;+\infty)$
C) $[-4;1] \cup (\log_2 3;+\infty)$
D) $[-4;0) \cup \{1\} \cup (\log_2 3;+\infty)$

8. Massalarining nisbati 3:5 bo'lgan Platiniy(*Pt*) va Mis(*Cu*) qotishmasiga massalarining nisbati 1:3 bo'lgan bo'lgan xuddi shunday qotishma qo'shilganda *Pt* va *Cu*larning nisbati 3:7 bo'lgan 20 kg qotishma hosil bo'ldi. Birinchi qotishmaning massasini toping.

A) 8 B) 12 C) 3 D) 5

9. Agar $\left(x-|x|^{\lg(-x)}\right)^5$ binom yoyilmasining uchinchi hadi (-10^6) ga teng bo'lsa, x ni toping.

A) $-10;-10^{-\frac{5}{2}}$ B) $-10;-10^{\frac{5}{2}}$ C) -10 D) $-10^{-\frac{5}{2}}$

10. Tengsizlikni yeching:

$$\operatorname{ctg}x + \operatorname{ctg}^3 x > \operatorname{tg}2x \ \left(0 < x < \frac{\pi}{4}\right).$$

A) $\left(0;\frac{1}{2}\arccos(2-\sqrt{3})\right)$
B) $\left(\frac{1}{2}\arccos(2-\sqrt{3});\frac{\pi}{4}\right)$
C) $\left(0;\frac{1}{2}\arccos(2-\sqrt{3})\right) \cup \left(\frac{1}{2}\arccos(2-\sqrt{3});\frac{\pi}{4}\right)$
D) $\left(\frac{1}{4}\arccos(2-\sqrt{3});\frac{\pi}{4}\right)$

11. a parametrning qanday qiymat(lar)ida

$$\ln(x-2a) - 3(x-2a)^2 + 2a = 0$$

tenglama yagona yechimga ega bo'ladi?

A) $\frac{\ln 6+1}{4}$ B) $\frac{\ln 6+2}{2}$ C) $1, \frac{\ln 6+1}{2}$ D) $\frac{\ln 6+1}{2}$

12. Tenglama $\left[-3\pi;-\frac{3\pi}{2}\right]$ oraliqda nechta yechimga ega?

$$\frac{13\sin^2 x - 5\sin x}{13\cos x + 12} = 0$$

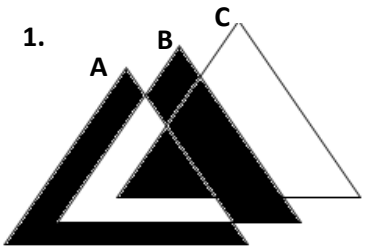
A) 3 B) 4 C) 2 D) 0

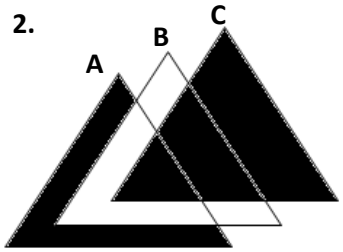
13. Tengsizlikning butun yechimlari nechta?

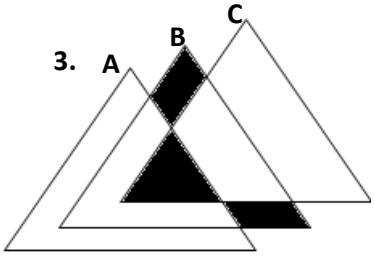
$$\left(3^{\frac{x-2}{2}}-1\right)\sqrt{3^x - 10\sqrt{3^x}+9} \ge 0, x \le 8$$

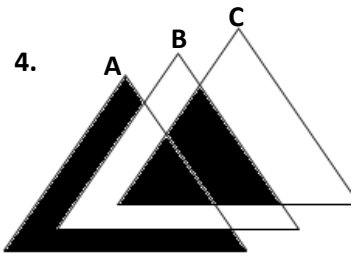
A) *cheksiz ko'p* B) 5 B) 4 D) 6

14. Bo'yalgan sohalardan qaysi biri $(A \setminus B) \cup (B \cap C)$ to'plamni ifodalaydi?

1. 

2. 

3. 

4. 

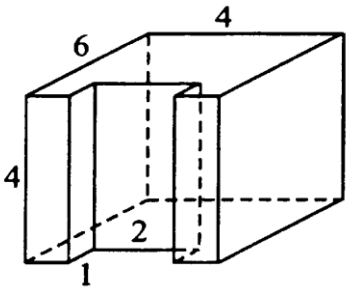
A) 1 B) 3 C) 2 D) 4

15. $y = f(x)$ funksiya grafigini Ox o'qdan 4 marta cho'zish, Oy o'qdan 7 marta qisish orqali hosil qilingan funksiyaning aniqlanish sohasi $\left(-4;\frac{7}{8}\right)$ oraliq bo'lsa, $y = f(x)$ funksiyaning aniqlanish sohasini toping.

A) $\left(-28;\frac{49}{8}\right)$ B) $\left(-\frac{4}{7};\frac{1}{8}\right)$ C) $\left(-1;\frac{7}{32}\right)$ D) $\left(-16;\frac{7}{2}\right)$

16. Chizmada tasvirlangan ko'pyoq sirtining yuzini toping. Bunda barcha ikki yoqli burchaklar to'g'ri.

A) 92
B) 132
C) 86
D) 130



17. Hisoblang:

$$\frac{1\cdot 2+2\cdot 3+3\cdot 4+\ldots+15\cdot 16}{(1+2+3+\ldots+15)\cdot\frac{1}{6}}$$

A) 78 B) 68 C) 45 D) 40

18. Tomonlari 5, $\sqrt{7}$ va $2\sqrt{3}$ bo'lgan uchburchakka tashqi chizilgan aylana radiusini toping.

A) $\sqrt{3}$ B) $\sqrt{7}$ C) 3 D) 1

19. Qavariq ko'pyoqning uchlari soni yoqlari sonidan 8 ta ortiq, qirralari soni esa yoqlari sonidan 3 marta ko'p bo'lsa, ko'pyoqning uchlari sonini toping.

A) 6 B) 12 C) *aniqlab bo'lmaydi* D) 14

20. $y=f(x)$ funksiyaning davri 3 ga teng.

$$y=-\frac{1}{2f\left(\frac{1}{2}x-4\right)}+4$$

funksiyaning davrini toping.

A) 3/2 B) 4 C) 6 D) 12

21. $y=\left|\sin|x|+\frac{\sqrt{3}}{2}\right|$ funksiya $x\in\left(-2\pi;\frac{\pi}{3}\right)$ oraliqning nechta nuqtasida hosilaga ega emas?

A) 2 B) 3 C) 4 D) 1

22. Tengsizliklar sistemasini yeching:

$$\begin{cases}\dfrac{1}{x-1}+\dfrac{2}{x-2}-\dfrac{6}{x-3}\ge 0\\ \sqrt{x^2+34}\ge 6\end{cases}$$

A) $(-\infty;-\sqrt{2}]\cup\left[\sqrt{2};\frac{5}{3}\right]$ B) $(2;3)$
C) $(-\infty;-\sqrt{2}]\cup\left[\sqrt{2};\frac{5}{3}\right]\cup(2;3)$ D) $(-\infty;1)$

23. $x^2+3x-4\le 0$ tengsizlikning yechimlar to'plamida $y=x^2+2x-3$ funksiya qanday qiymatlar qabul qiladi?

A) $-4\le y\le 5$ B) $-4\le y\le 0$ C) $0\le y\le 5$
D) $y\in\mathcal{R}$

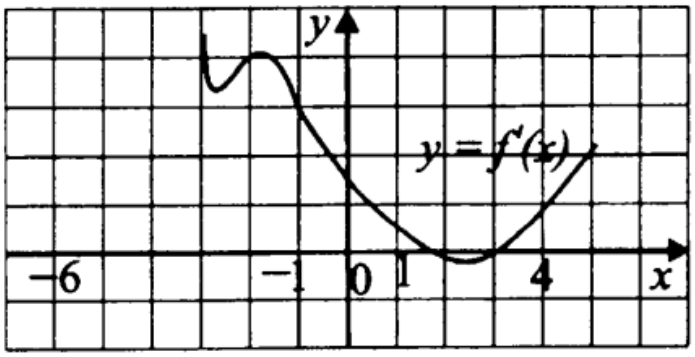
24. Qaysi nuqta $y=x^3+5x-2$ funksiyaga teskari funksiyaning grafigiga tegishli?

A) $(-2;1)$ B) $(0;-2)$ C) $(4;1)$ D) $(4;5)$

25. $y=k_1x+n_1$ va $y=k_2x+n_2$ to'g'ri chiziqlar orasidagi burchak β bo'lsa, ctg β ni toping.

A) $\left|\frac{k_2-k_1}{1+k_1k_2}\right|$ B) $\left|\frac{1+k_1k_2}{k_2-k_1}\right|$ C) $\frac{k_2-k_1}{1+k_1k_2}$ D) $\frac{1+k_1k_2}{k_2-k_1}$

26. Chizmada $y=f(x)$ funksiya hosilasining grafigi tasvirlangan. Unga ko'ra $y=f(x)$ funksiya grafigining qaysi nuqtasiga o'tkazilgan urinma $y=3x+7$ to'g'ri chiziq bilan ustma – ust tushadi?



A) $(-1;4)$ B) $(1;10)$ C) $(0;7)$ D) $(-2;1)$

27. Hisoblang:

$$\lim_{x\to\infty}\left(1+\frac{2}{x}\right)^x$$

A) ∞ B) 1 C) e D) e^2

28. Trapetsiyaning asoslari a va b ga teng. Uning asoslariga parallel va yuzasini teng ikkiga bo'luvchi chiziqning uzunligini toping.

A) $\sqrt{\frac{a^2+b^2}{2}}$ B) $\sqrt{ab}$ C) $\frac{2ab}{a+b}$ D) $\frac{a^2+b^2}{2}$

29. ABCD to'rtburchakda $\angle BCA = \angle ADB = 30°$, $\angle BAC = 45°$ bo'lsa, $\angle BDC$ =?

A) *aniqlab bo'lmaydi* B) 45,5° C) 45° D) 15°

30. 5; 9; 13; 17; … , arifmetik progressiyaning dastlabki nechta hadining yig'indisi 10877 ga teng bo'ladi?

A) 74 B) 73 C) 76 D) 72

	0	1	2	3	4	5	6	7	8	9
0		A	C	B	B	A	A	D	A	A
1	A	A	A	D	D	B	B	B	B	D
2	C	B	C	A	C	B	A	D	A	C
3	B									

Maxsus test 6

1. $y = f(x), \mathcal{D}(f) = \mathbb{R}$ toq funksiya bo'lsa, quyidagilardan nechtasi to'g'ri:

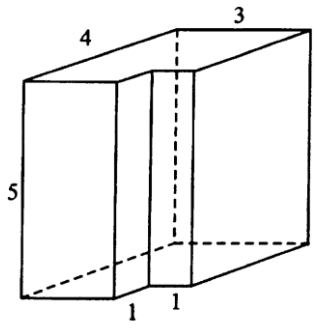
1.1. $f(0) = 0$;
1.2. $y = |f(x)|$ juft funksiya;
1.3. $x > y > z$ bo'lsa, $f(|x-y|) + f(|z-y|) + f(|x-z|) = 0$.

A) 1 B) 2 C) 3 D) 0

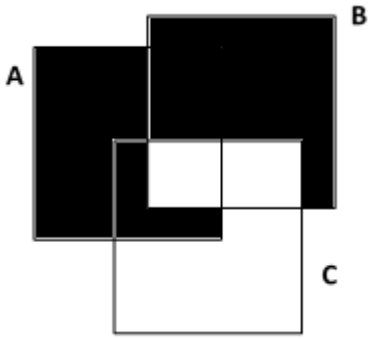
2. Quyida keltririlgan funksiyalardan qaysi birining grafigi $y = -x + 2$ to'g'ri chiziqqa nisbatan $y = \lg\left(\frac{1}{x} + 3\right)$ funksiyaning grafigiga simmetrik bo'ladi?

A) $y = 2 - \frac{1}{10^{2-x}-3}$ **B)** $y = 2 + \frac{1}{10^{2-x}-3}$

C) $y = 2 + \frac{1}{10^{2-x}+3}$ **D)** $y = 2 - \frac{1}{10^{2+x}-3}$



3. Quyida bo'yalgan soha qaysi to'plamni ifodalaydi?



A) $(A \cup B) \cup C$ **B)** $(A \backslash B) \backslash C$
C) $(A \backslash B) \cup (B \backslash C)$ **D)** $(A \cup B) \cap C$

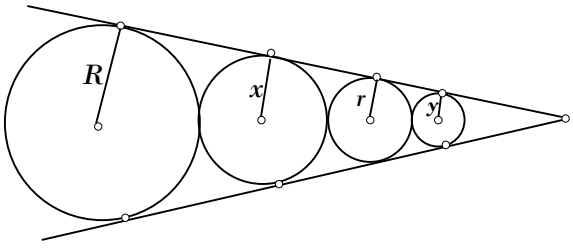
4. Chizmada tasvirlangan ko'pyoqning hajmini toping. Bunda uning barcha ikki yoqli burchaklari to'g'ri.

A) 60
B) 59
C) 55
D) 50

5. $y = x\sqrt{x} - 6x + 2000$ funksiyaning $x \in [2; 30]$ kesmadagi eng katta qiymatini toping.

A) 1968 B) $2\sqrt{2} + 1988$ C) $30\sqrt{30} + 1820$
D) 1990

6. Shaklga ko'ra $\frac{x}{y}$ ni toping. Bunda $R = 5, r = 2$.



A) 5/2 B) 7/3 C) 2 D) $\sqrt{10}/3$

7. Diagonallari d_1 va d_2 hamda balandligi h ga teng bo'lgan trapetsiyaning yuzasini toping.

A) $\frac{d_1 + d_2}{2} h$ **B)** $\frac{\sqrt{d_1^2 + h^2} + \sqrt{d_2^2 + h^2}}{2} h$ **C)** $\frac{\sqrt{d_1^2 - h^2} + \sqrt{d_2^2 - h^2}}{2} h$

D) $\dfrac{\sqrt{d_1^2-h^2}+\sqrt{d_2^2-h^2}}{4}h$

8. $X=\{1,2,3,4\}$ va $Y=\{-1,2,3\}$ to'plamlar berilgan. Necha xil usul bilan X to'plamni Y to'plamga mos qo'yuvchi funksiya qurish mumkin?

A) 64 **B)** 81 **C)** 49 **D)** 25

9. Tengsizlikni yeching:

$$\sin\left(\frac{x}{\sqrt{1-x}}+\frac{1}{x}\right)\geq -1$$

tengsizlikni yeching.

A) $\mathbb{R}$ **B)** $(-\infty;0)$ **C)** $(-\infty;0)\cup(0;1)$ **D)** $\emptyset$

10. Soat millari $18{:}23$ **ni ko'rsatmoqda. Soat va minut millari orasidagi burchakni toping.**

A) $53,5°$ **B)** $56°$ **C)** $56,6°$ **D)** $53°$

11. Ifodaning qiymatini toping:

$$5\log_{1,6}3\cdot\log_3 0,625$$

A) $\frac{2}{3}$ **B)** $-\frac{2}{3}$ **C)** -5 **D)** $-\frac{1}{3}$

12. k **ning qanday qiymatida**

$$(kx-2)\log_2(x-k)=0$$

tenglama yagona yechimga ega bo'ladi?

A) $k\in\{0,-2,1\}$
B) $k\in\left[-\sqrt{2};0\right]\cup\left[\sqrt{2};+\infty\right)$
C) $k\in\left[-\sqrt{2};0\right]\cup\left[\sqrt{2};+\infty\right)\cup\{-2;1\}$
D) $k\in\left\{\pm\sqrt{2},0,-2,1\right\}$

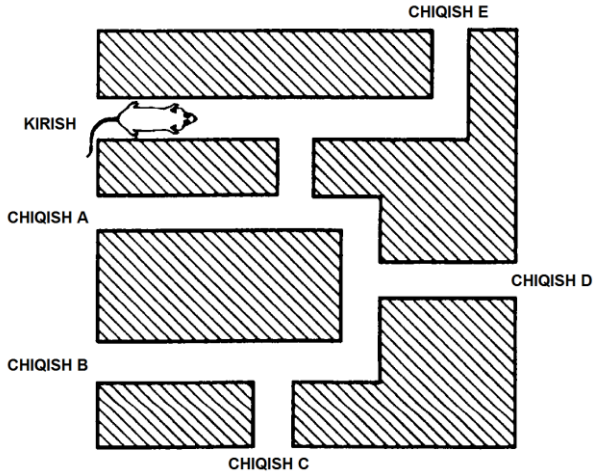
13. $S(n)-n$ **natural sonning raqamlari yig'indisi bo'lsa, nechta natural son**

$$n+S(n)+S\big(S(n)\big)=35$$

tenglikni qanoatlantiradi?

A) 1 **B)** 2 **C)** 3 **D)** 0

14. Rasmda labirint tasvirlangan. Sichqon labirintning «KIRISH» qismidan harakatlana boshladi. Agar u orqaga qaytmasa va har bir yo'ldan faqat bir marta o'tishi mumkin bo'lsa, sichqonning labirintning C joyidan chiqishi ehtimolini toping.



A) 0,125 **B)** 0,25 **C)** 0,0625 **D)** 0,375

15. Tengsizlikni yeching:

$$\frac{3^{2x}+2\cdot3^x+2}{3^{2x}+2\cdot3^x}\leqslant 4+\frac{1}{3^x}-\frac{3\cdot3^x+1}{3^x-1}$$

A) $(-\infty;0)$ **B)** $(0;+\infty)$ **C)** $[-1;0)$ **D)** $(-1;0)$

16. $y=f(x)$ **funksiya** $(-1;4)$ **oraliqda,** $y=2\cdot g(x)$ **funksiya esa** $(0;9)$ **oraliqda aniqlangan bo'lsa,**

$$y=-\frac{1}{2}f^2(x)+\frac{3}{4}g(x)$$

funksiyaning aniqlanish sohasini toping.

A) *aniqlab bo'lmaydi* **B)** $(0;4)$ **C)** $(-1;9)$
D) $(-1;0)\cup(0;4)\cup(4;9)$

17. $\sin 2°=a$ **bo'lsa,** $\operatorname{tg}46°$ **ni toping.**

A) $\sqrt{\frac{1+a}{1-a}}$ **B)** $\sqrt{\frac{1-a}{1+a}}$ **C)** $-\sqrt{\frac{1+a}{1-a}}$
D) $\sqrt{\frac{1+a^2}{1-a^2}}$

18. $2x^5+3x^2+4x+b^2x-a$ **ko'phad** x^2+x+1 **ko'phadga qoldiqsiz bo'linsa,** a **ni toping.**

A) 5 **B)** 4 **C)** -5 **D)** 0

19. $x^2+mx+\frac{6}{m}=0$ **tenglamaning ildizlari** x_1 **va** x_2 **bo'lib,** $x_1<3<x_2$ **tengszilikni qanoatlantirsa,** m **ni toping.**

A) $(-\infty;0)$ **B)** $(-1;0)$ **C)** $(-\infty;-2)$ **D)** $(-\infty;-2)\cup(-1;0)$

20. $x+\frac{x}{\sqrt{x^2-1}}=\frac{35}{12}$ **tenglamaning ildizlari nechta?**

A) 4 *ta* **B) 1** *ta* **C) 3** *ta* **D) 2** *ta*

21. Kesmaning bir uchi $A(2;3;4)$**, ikkinchi uchi esa** $B(-1;2;-4)$ **nuqtada. AB kesmada C nuqta olingan. Agar** $\frac{AC}{CB}=\frac{3}{4}$ **bo'lsa, C nuqtaning koordinatalarini toping.**

A) $\left(\frac{5}{7},\frac{18}{7},\frac{4}{7}\right)$ **B)** $\left(-\frac{5}{7},\frac{18}{7},-\frac{4}{7}\right)$ **C)** $\left(\frac{5}{6},\frac{18}{7},\frac{4}{5}\right)$ **D)** $\left(\frac{5}{7},-\frac{18}{7},-\frac{4}{7}\right)$

22. a **parametrning nechta haqiqiy qiymatida** $\frac{x-3a}{x+3}+\frac{x-2}{x-a}=1$ **tenglama yagona yechimga ega bo'ladi?**

A) 2 **B) 3** **C) 1** **D) 4**

23. Silindr balandligi va asosining radiusi 8 ga teng. Yuzi silindrning to'la sirtiga teng bo'lgan doiraning radiusini toping.

A) 8 **B) 16** **C) 12** **D) 9**

24. $F(x)=\int_{x}^{x^2}t^t dt$, $F'(1)=?$

A) 1 **B)** $\ln\sqrt{3}$ **C) 2** **D)** $\frac{1}{\sqrt{3}}$

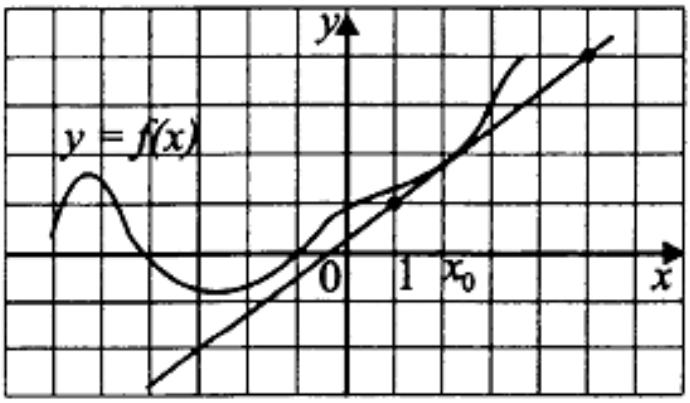
25. Barcha uch xonali sonlar ichida 44 ga qoldiqsiz bo'linadiganlari nechta?

A) 20 **B) 19** **C) 21** **D) 22**

26. Muntazam to'rtburchakli kesik piramidaning balandligi 8 ga, asosining tomonlari 12 va 20 ga teng. Kesik piramidaning diagonalini toping.

A) 24 **B) 48** **C) 40** **D) 36**

27. Chizmada $y=f(x)$ **funksiya grafigi va uning absissasi** x_0 **bo'lgan nuqtasiga o'tkazilgan urinmasi tasvirlangan.** $f'(x_0)$ **ni toping.**



A) 0,75 **B) 2** **C) 0,25** **C) 1**

28. $27^x-5\cdot 9^x-3^{x+4}+405=0$ **tenglamaning** $[\log_3 6\,;\log_3 10]$ **oraliqqa tegishli ildizlarining o'rta arifmetigini toping.**

A) 2 **B)** $\log_3\sqrt{45}$ **C)** $\log_3\sqrt{15}$ **D) 0**

29. $(x+12)^2=48x$ **tenglama nechta yechimga ega?**

A) 1 **B) 2** **C) 0** **D) 3**

30. Hisoblang:

$$\lim_{x\to-\infty}\left(\sqrt{(1-x)(2-x)}-x\right)$$

A) $-\frac{3}{2}$ **B)** $\frac{3}{2}$ **C)** $\frac{1}{2}$ **D)** ∞

	0	1	2	3	4	5	6	7	8	9
0		B	A	C	C	B	A	C	B	C
1	A	C	C	D	C	A	B	A	C	D
2	A	A	D	B	A	A	A	A	A	A
3	D									

Maxsus test 7

1. Hisoblang:

$$\frac{0{,}23(7)+\frac{43}{450}}{0{,}5(61)-\frac{113}{495}}$$

A) 1 **B)** $0,(3)$ **C)** $\frac{1}{4}$ **D)** $1,(3)$

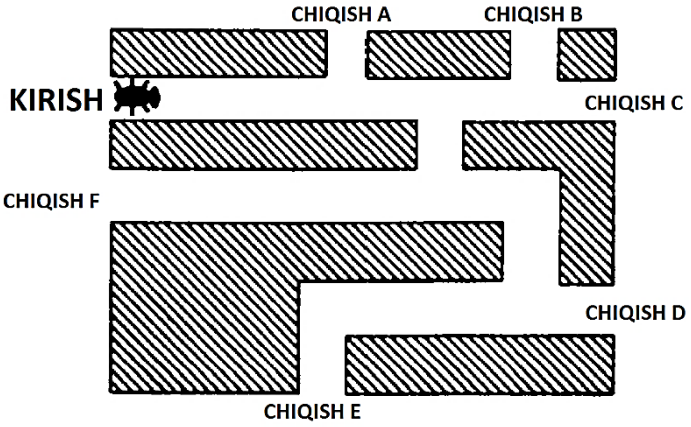
2. Ushbu

$$(25a^2-36)\cdot\left(\frac{1}{5a-6}-\frac{1}{5a+6}\right)+a-37$$

ifodaning $a = 157$ dagi qiymatini hisoblang.

A) 132 B) 130 C) 133 D) 140

3. Rasmda labirint tasvirlangan. Tarakan labirintning «KIRISH» qismidan harakatlana boshladi. Agar u orqaga qaytmasa va har bir yo'ldan faqat bir marta o'tishi mumkin bo'lsa, tarakanning labirintning E joyidan chiqishi ehtimolini toping.



A) 1/16 B) 1/8 C) 1/6 D) 1/12

4. $\text{tg}\frac{\pi x}{3} = -\sqrt{3}$ tenglamaning eng kichik musbat ildizini toping.

A) 1 B) 2 C) 5 D) 8

5. Ifodaning qiymatini toping:

$$(1 - \log_7 14)(1 - \log_2 14)$$

A) – 1 B) 2 C) 1 D) $\frac{1}{2}$

6. To'g'ri burchakli dekart koordianatalar sistemasida $y = x^2 - 4x + 5$ funksiyaning grafigiga tegishli $A(1; y_1)$ va $B(x_2; 1)$ nuqtalar berilgan. $\overrightarrow{OA}$ va $\overrightarrow{OB}$ vektorlarning skalyar ko'paytmasini toping. Bunda O nuqta koordinata boshi.

A) -4 B) 0 C) 2 D) 4

7. Tengsizlikni yeching:

$$\frac{1}{\log_{x^2+x} 0{,}5} + \frac{1}{\log_{x^2+x} 0{,}25} + \frac{1}{\log_{x^2+x} 4} \geqslant 1$$

A) $\left[\frac{-1-\sqrt{3}}{2}; \frac{-1+\sqrt{3}}{2}\right]$

B) $\left[\frac{-1-\sqrt{3}}{2}; 0\right) \cup \left(0; \frac{-1+\sqrt{3}}{2}\right]$

C) $\left[\frac{-1-\sqrt{3}}{2}; -1\right) \cup \left(0; \frac{-1+\sqrt{3}}{2}\right]$

D) $\left[\frac{-1-\sqrt{3}}{2}; -1\right) \cup (-1; 0) \cup \left(0; \frac{-1+\sqrt{3}}{2}\right]$

8. $\sqrt{9^x - 4a} = 3^x - a$ tenglama a ning qanday qiymat(lar)ida yagona yechimga ega bo'ladi?

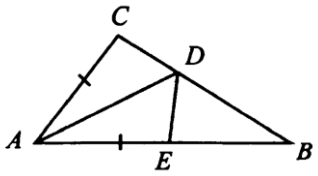
A) $a < 0, 0 < a \leq 4$

B) $-4 < a < 0, 0 < a \leq 4$

C) $a > 4$

D) $a = 1, a = 4$

9. ABC uchburchakda $\angle B = 48°, \angle C = 95°$, $AD -$ bissektrisa. AB tomondan E nuqta olingan, bunda $AE = AC$. BDE burchakni toping.



A) 45° B) 43° C) 47° D) 40°

10. $\arcsin(\cos 7)$ ni toping.

A) $\frac{\pi}{2} - 7$ B) $2\pi - 7$ C) $7 - \frac{5\pi}{2}$

D) $\frac{5\pi}{2} - 7$

11*. l_1, l_2 va l_3 to'g'ri chiziqlar bir tekislikda yotadi va o'zaro parallel. l_1 chizidan 5 ta, l_2 chiziqdan 3 ta va l_3 chiziqdan 6 ta nuqta olingan. Uchlari shu nuqtalarda bo'lgan nechta uchburchak yasash mumkin.

A) 240 B) 333 C) 420 D) 82

12. To'g'ri burchakli uchburchakka ichki va tashqi chizilgan aylanalarning radiuslari mos ravishda $r = 3, R = 7$ ga teng bo'lsa, uchburchakning yuzini toping.

A) 51 B) 52 C) 49 D) 61

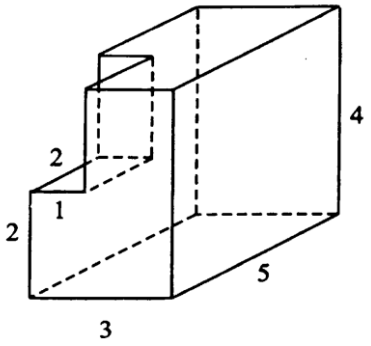
13*. Odatda havo tarkibida hajm jihatdan 0,04% karbonat angidrid bo'ladi. Agar uning havodagi miqdori 0,1% gacha ko'tarilsa, bosh og'rig'i va nafas qiyinlashuvi vujudga keladi. 16 ta o'quvchidan iborat havo almashtirgich tizimi bo'lmagan $5 \times 8 \times 4$ m^3 o'lchamli o'quv zalida qancha vaqt($minut$)dan so'ng yuqoridagi holatlar kuzatila boshlaydi? (1 ta o'quvchi bir soatda 20 litr karbonat angidrid ajratadi deb hisoblang)

A) 360 B) 42 C) 18 D) 30

14. $3x\lg x = 1 + a\lg x$ **tenglama** a **parametrning qanday qiymat(lar)ida yagona yechimga ega bo'ladi?**

A) $a > 0$ **B)** $a \le 0$ **C)** $a > 1$ **D)** $a \le 1$

15. Rasmda tasvirlangan ko'pyoq sirtining yuzini toping. Bunda barcha ikkiyoqli burchaklar to'g'ri burchakli.



A) 92
B) 90
C) 94
D) 100

16. $(4-6x)^{21}$ **binomning binomial koeffitsiyentlari yig'indisi uning koeffitsiyentlari yig'indisidan necha marta katta?**

A) 1 B) – 1 C) 2 D) – 2

17. Integralni hisoblang:

$$\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \frac{\mathrm{tg}^{101}x}{1+x^2}\,dx$$

A) *aniqlab bo'lmaydi* **B)** $\frac{\pi}{4}\sqrt{2}$ **C) 1 D) 0**

18. $y = \frac{1}{\sqrt{1+x^2}}, x = -1, x = 1, y = 0$ **chiziqlar bilan chegaralangan shaklni** $0x$ **o'qi atrofida aylantirishdan hosil bo'lgan jismning hajmini toping.**

A) $\frac{\pi}{2}$ **B)** $\frac{\pi^2}{2}$ **C)** $\frac{\pi}{4}$ **D)** $\frac{\pi^2}{4}$

19. $X = \{5, 8, 9\}$ **va** $Y = \{0, 2, 3, 4\}$ **to'plamlar berilgan. Necha xil usul bilan** X **to'plamni** Y **to'plamga mos qo'yuvchi funksiya qurish mumkin?**

A) 64 B) 81 C) 80 D) 72

20. Qirralari a **teng bo'lgan ikkita kub bir – birining ichida joylashgan. Ulardan biri qarama – qarshi yon qirralaridan o'tuvchi tekislikka nisbatan** $45°$ **ga burildi. Hosil bo'lgan ko'pyoq sirtining yuzini toping.**

A) $12a^2(2-\sqrt{2})$ **B)** $12a^2(\sqrt{2}-1)$

C) $a^2(12-6\sqrt{2})$ **D)** $\frac{5}{2}a^2$

21*. 5 ga bo'lganda 1 qoldiq qoluvchi va raqamlari takrorlanmaydigan besh xonali sonlar nechta?

A) 5376 B) 4376 C) 5378 D) 5476

22. Ushbu matritsalarning ko'paytmasini toping:

$$\begin{pmatrix} -1 & 2 \\ 2 & 1 \end{pmatrix} \cdot \begin{pmatrix} -2 & 2 \\ 0 & 1 \end{pmatrix}$$

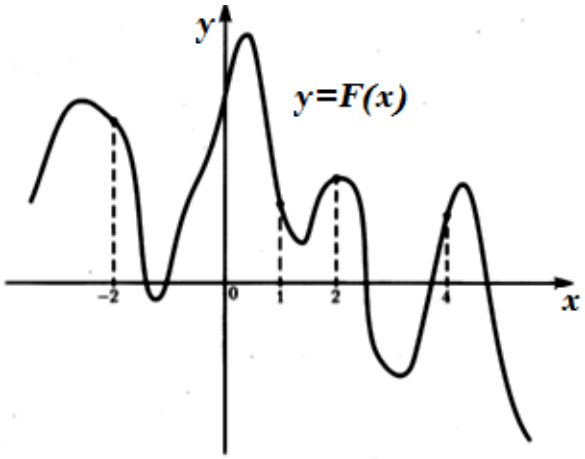
A) $\begin{pmatrix} 2 & 0 \\ -4 & 5 \end{pmatrix}$ **B)** $\begin{pmatrix} 2 & 4 \\ 0 & 1 \end{pmatrix}$ **C)** $\begin{pmatrix} 6 & 2 \\ -2 & 1 \end{pmatrix}$ **D)** $\begin{pmatrix} 1 & 1 \\ -1 & 1 \end{pmatrix}$

23*. $mx^2 + (m-2)x + 3 = 0$ **tenglamaning haqiqiy ildizlari** x_1 **va** x_2 **bo'lib,** $1 < x_1 < 2 < x_2$ **bo'lsa,** $m =$?

A) $m \in (0;1)$ **B)** $m \in \left(0;\frac{1}{2}\right)$ **C)** $m \in \left(0;\frac{1}{6}\right)$ **D)** $m \in \left(\frac{1}{2};+\infty\right)$

24. Chizmada $y = f(x)$ **funksiyaning boshlang'ich funksiyalaridan biri** $y = F(x)$ **ning grafigi va** $-2, 1, 2, 4$ **nuqtalar berilgan. Bu nuqtalardan qaysi birida** $f(x)$ **funksiya eng katta qiymat qabul qiladi?**

A) 4 B) 2 C) – 2 D) 1



25. $f(x) = 2^{\frac{1}{f(x)}-5x}$ **bo'lsa,** $y = f(x)$ **funksiyaga teskari funksiyani toping.**

A) $y=\frac{1}{5x}-\frac{\log_2 x}{5}$ B) $y=\frac{1}{x}+\frac{\log_2 x}{5}$
C) $y=\frac{1}{5x}+\frac{\log_2 x}{5}$ D) $y=5x+\log_2 x$

26. Tomoni a ga teng bo'lgan ikkita muntazam uchburchak ustma – ust qo'yilgan. Ulardan biri ikkinchisining uchlaridan biri atrofida $30°$ ga burildi. Hosil bo'lgan shaklning yuzini toping.

A) $\frac{a^2}{4}(5\sqrt{3}-6)$ B) $\frac{3\sqrt{3}}{8}a^2$ C) $\frac{a^2}{4}(7\sqrt{3}+8)$
D) $\frac{5\sqrt{3}}{8}a^2$

27. $(3|x|-3)^2=|x|+7$ tenglamaning $y=\sqrt{x(x-3)}$ funksiyaning aniqlanish sohasiga tegishli bo'lgan ildizlari nechta?

A) 2 B) 3 C) 4 D) 1

28. Tengsizlikni qanoatlantiruvchi eng katta butun son x_0 bo'lsa, $\log_3(6-x_0)$ ni hisoblang.

$$\sqrt{(x+3)(x-8)}>x+2$$

A) 1 B) 2 C) 3 D) $\log_3 2$

29. Soddalashtiring:

$$\text{tg}9°-\text{tg}63°+\text{tg}81°-\text{tg}27°$$

A) 1 B) 2 C) 4 D) 0

30. $y=\frac{1}{x}, y=0, x=1, x=2$ chiziqlar bilan chegaralangan shakl berilgan. $y=\frac{1}{x}$ funksiya grafigining qaysi nuqtasiga o'tkazilgan urinma to'g'ri chizigi shakldan eng katta yuzaga ega bo'lgan trapetsiya ajratadi?

A) $\frac{5}{4}$ B) 1 C) 2 D) $\frac{3}{2}$

	0	1	2	3	4	5	6	7	8	9
0		A	A	A	B	C	D	C	A	C
1	D	B	A	C	B	C	B	D	B	A
2	A	A	A	C	A	A	A	A	B	C
3	D									

Maxsus test 8

1. Hisoblang: $\dfrac{\frac{5}{2}+\frac{5}{4}+\frac{5}{6}+\frac{5}{8}+\frac{5}{10}}{\frac{4}{3}-\frac{4}{6}-\frac{4}{9}-\frac{4}{12}-\frac{4}{15}}$

A) $-1/2$ B) $-9/8$ C) $-5/4$ D) $-15/8$

2. A va B matritsalar ustida ko'rsatilgan amalni bajaring:

$$A=\begin{pmatrix}-1 & 0\\ 0 & 1\\ 3 & 2\end{pmatrix}, B=\begin{pmatrix}1 & -1\\ 0 & 1\\ -2 & 1\end{pmatrix};\quad 2A-3B=?$$

A) $\begin{pmatrix}-5 & 3\\ 0 & -1\\ 12 & 1\end{pmatrix}$ B) $\begin{pmatrix}5 & -3\\ 0 & 1\\ 12 & 1\end{pmatrix}$ C) $\begin{pmatrix}-5 & 3\\ 0 & 1\\ -12 & -1\end{pmatrix}$ D) $\begin{pmatrix}5 & 3\\ 0 & -1\\ -2 & 1\end{pmatrix}$

3. i – mavhum birlik ($i^2=-1$) bo'lsa, a va b kompleks sonlar ustida quyidagi amalni bajaring:

$$a=-3+2i,\qquad b=3-7i;\ a^2-2ib^2=?$$

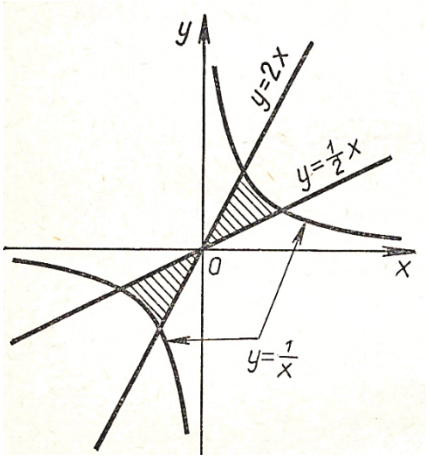
A) $-79+68i$ B) $89+68i$ C) $79-68i$
D) $-89+68i$

4. Kasrning maxrajini irratsionallikdan qutqaring:

$$\frac{2}{\sqrt[3]{9}+\sqrt[3]{3}+2}$$

A) $-\sqrt[3]{9}+\sqrt[3]{3}+1$ B) $-\sqrt[3]{9}+\sqrt[3]{3}+2$
C) $\sqrt[3]{9}-\sqrt[3]{3}-2$ D) $\sqrt[3]{9}+\sqrt[3]{3}-2$

5. Rasmda chegaralarining tenglamasi bilan berilgan shtrixlangan sohaning yuzini toping:



A) $\ln 2-\frac{1}{4}$ **B)** $\ln 4$ **C)** $\ln 2+\frac{1}{4}$ **D)** $\ln 4+\frac{1}{2}$

6. Tenglama nechta yechimga ega:

$$\sqrt{-x}+\sqrt{-x-\sqrt{x+1}}=1$$

A) 0 **B) 2** **C) 1** **D) 3**

7. Teng yonli ABC ($AB=AC$) uchburchakda $\widehat{BAC}=80°$. Uchburchak ichidan O nuqta shunday olinganki, $\widehat{OBC}=10°$, $\widehat{OCB}=30°$. AOB burchakning qiymatini toping.

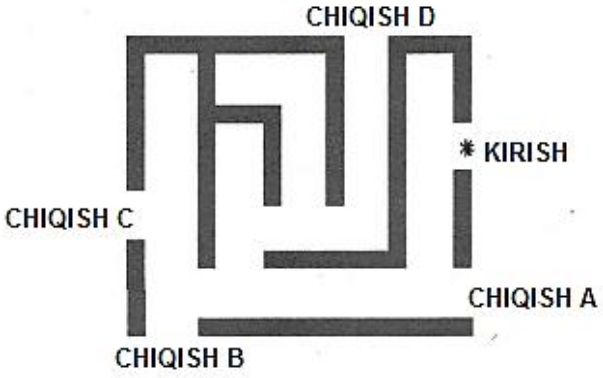
A) 50° **B) 80°** **C) 70°** **D) 85°**

8. Tenglamaning ildizlari yig'indisini toping.

$$x^{\lg^2 x+3\lg x+3}=\frac{2}{\frac{1}{\sqrt{x+1}-1}-\frac{1}{\sqrt{x+1}+1}}$$

A) 1,11 **B) 1,1** **C) 0,11** **D) 1,01**

9. Rasmda labirint tasvirlangan. O'rgimchak labirintning «KIRISH» qismidan harakatlana boshladi. Agar u orqaga qaytmasa va har bir yo'ldan faqat bir marta o'tishi mumkin bo'lsa, o'rgimchakning labirintning D joyidan chiqishi ehtimolini toping.



A) 1/16 **B) 1/8** **C) 1/64** **D) 1/32**

10. Tenglamalar sistemasini qanoatlantiruvchi barcha x va y larning yig'indisini toping.

$$\begin{cases}\sqrt{x+\frac{1}{y}}+\sqrt{x+y-3}=3\\ 2x+y+\frac{1}{y}=8\end{cases}$$

A) 4 **B) 16** **C) 22** **D) 8**

11. Quyidagi birlashmali sistemani yeching:

$$\left[\begin{array}{l}\frac{2x+1}{5}-\frac{2-x}{3}>1\\ -4x-1>0\end{array}\right.$$

A) $\emptyset$ **B)** $\left(-\infty;-\frac{1}{4}\right)\cup(2;+\infty)$ **C)** $(2;+\infty)$ **D)** $\left(-\infty;-\frac{1}{4}\right)$

12. Tengsizlikni yeching:

$$3\sqrt{-x^2+x+6}>-2(2x-1)$$

A) $\left(-1;\frac{1}{2}\right]$ **B)** $(-1;1)$ **C)** $\left(\frac{1}{2};3\right]$ **D)** $(-1;3]$

13. Dastlabki 100 ta natural son ichida 2 ga yoki 3 ga yoki 7 ga bo'linadigan sonlar nechta?

A) 75 **B) 78** **C) 72** **D) 102**

14. Tenglamaning eng kichik musbat yechimi x_0 bo'lsa, $x_0-\frac{\pi}{2}$ ni toping.

$$\sin x+\operatorname{tg}x=\frac{1}{\cos x}+\cos(x+\pi)$$

A) $-\frac{\pi}{2}$ **B)** $\frac{3\pi}{2}$ **C) 0** **D)** $\frac{\pi}{2}$

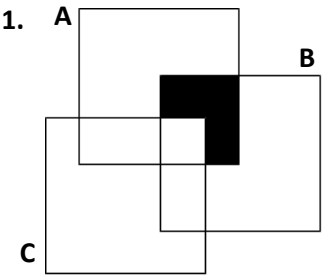
15. Tengsizlikni yeching:

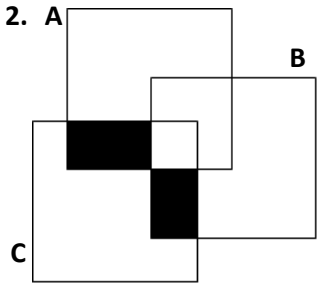
$$\log_{\frac{4}{3}}\cos x\geq\log_{\frac{4}{9}}\frac{3}{2},\quad -2<x<3$$

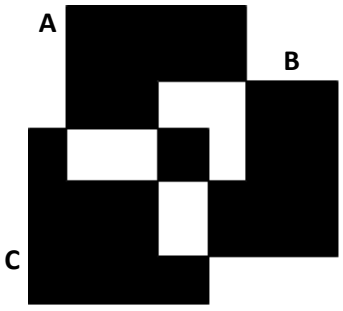
A) $\left[-\frac{\pi}{6};\frac{\pi}{6}\right]$ **B)** $\left(-2;-\frac{\pi}{6}\right]\cup\left[\frac{\pi}{6};3\right)$ **C)** $\left(-2;-\frac{\pi}{6}\right]$ **D)** $\left[\frac{\pi}{6};3\right)$

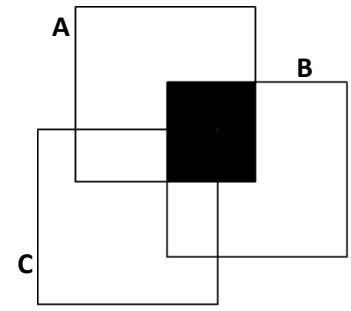
16. Quyidagi bo'yalgan sohalardan qaysi biri $(A\cap B)\setminus C$ to'plamni ifodalaydi?

A) 4 **B) 2** **C) 3** **D) 1**

1. 

2. 

3. 

4. 

17. Tengsizlikni yeching:

$$\begin{cases} \text{tg}x \geq -\sqrt{3} \\ \sin x < \dfrac{1}{2} \end{cases}$$

A) $\left[-\frac{\pi}{3}+2\pi n;\frac{\pi}{6}+2\pi n\right)\cup\left(\frac{5\pi}{6}+2\pi n;\frac{3\pi}{2}+2\pi n\right)$

B) $\left[-\frac{\pi}{3}+\pi n;\frac{\pi}{6}+\pi n\right)\cup\left(\frac{5\pi}{6}+\pi n;\frac{3\pi}{2}+\pi n\right)$

C) $\left[-\frac{\pi}{3}+2\pi n;\frac{\pi}{6}+2\pi n\right)$

D) $\left[-\frac{\pi}{3}+\pi n;\frac{\pi}{6}+\pi n\right)$

18. Hisoblang:

$$\arcsin\left(\cos\left(-\frac{10\pi}{3}\right)\right)$$

A) $\frac{\pi}{6}$ **B)** $\frac{5\pi}{6}$ **C)** $-\frac{\pi}{6}$ **D)** $\frac{\pi}{3}$

19. Tomoni a ga va o'tkir burchagi $60°$ ga teng bo'lgan ikkita romb ustma – ust qo'yilgan. Ulardan biri o'tkir burchagining uchiga nisbatan $30°$ ga burildi. Hosil bo'lgan shaklning perimetrini toping.

A) $\frac{a}{2}(7+\sqrt{3})$ **B)** $\frac{a}{2}(7-\sqrt{3})$
C) $a(7+\sqrt{3})$ **D)** $a(7-\sqrt{3})$

20. $x_n = 0,25\cdot 2^n - 3n$ sonli ketma – ketlikning dastlabki oltita hadi yig'indisini toping.

A) -63 **B)** 63 **C)** $-\frac{63}{2}$ **D)** $\frac{63}{2}$

21. Tengsizlikni yeching:

$$\log_2 \log_3 \frac{x-1}{x+1} < \log_{\frac{1}{2}} \log_{\frac{1}{3}} \frac{x+1}{x-1}$$

A) $(-\infty;-1)$ **B)** $(-\infty;-2)$ **C)** $(-2;-1)$
D) $(-\infty;0)$

22. $ABCD$ to'rtburchakda $|AB| = 6\sqrt{3}$ sm, $|CD| = 12$ sm, $\widehat{A} = 60°$, $\widehat{B} = 150°$, $\widehat{D} = 90°$ bo'lsa, $\frac{|BC|}{|AD|}$ ni toping.

A) $\frac{1}{\sqrt{3}}$ **B)** $\sqrt{3}$ **C)** 2 **D)** $\frac{1}{2}$

23. Tengsizlikni qanoatlantiruvchi butun sonlarning yig'indisini toping.

$$|7-2x| = |5-3x| + |x+2|$$

A) -2 **B)** 0 **C)** 1 **D)** -1

24. $S(n)-n$ natural sonning raqamlari yig'indisi bo'lsa, nechta natural son

$$n + S(n) + S\big(S(n)\big) = 49$$

tenglikni qanoatlantiradi?

A) 1 **B)** 2 **C)** 0 **D)** 3

25. Aniq integralni hisoblang:

$$\int_1^e x \ln x \, dx$$

A) $\frac{e^2-1}{4}$ **B)** $\frac{e^2+1}{4}$ **C)** $\frac{e-1}{4}$ **D)** $\frac{e+1}{4}$

26. DA, DB, DC kesmalar qirrasi a ga teng bo'lgan kubning D uchidan chiquvchi qirralari. DA va DB qirralarning o'rtasi va C uch orqali kubni kesuvchi

tekislik o'tkazilgan. Kubning markazidan bu tekislikkacha bo'lgan masofani toping.

A) $\frac{a}{2}$ **B)** $\frac{a\sqrt{3}}{3}$ **C)** $\frac{a\sqrt{3}}{4}$ **D)** $\frac{a}{3}$

27. Muntazam tetraedr kubga ichki chizilgan. Bunda tetraedr asosining uchlari kub asosining tomonlarida, uchi esa shu yoqqa qarama – qarshi yoqda yotadi. Kub va tetraedrga ichki chizilgan sferalarning radiuslari nisbatini toping.

A) $\frac{\sqrt{3}+1}{2}$ **B) 2** **C)** $\frac{\sqrt{5}}{2}$ **D)** $\sqrt{2}$

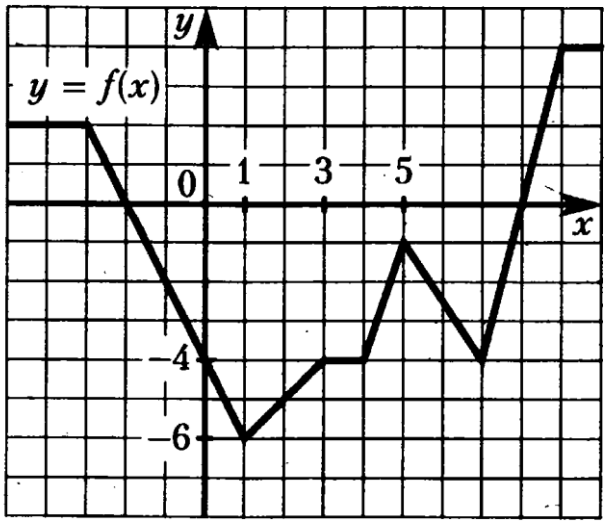
28. $y=f(x)$ **funksiya** $(0;4)$ **oraliqda,** $y=\frac{1}{2}\cdot g(x)$ **funksiya esa** $(-1;9)$ **oraliqda aniqlangan bo'lsa,**

$$y=\sqrt{2}f(2x)\cdot g(5x-2)-1$$

funksiyaning aniqlanish sohasini toping.

A) $\left(\frac{1}{5};\frac{11}{5}\right)$ **B)** $(0;2)$ **C)** $\left(0;\frac{11}{5}\right)$ **D)** $\left(\frac{1}{5};2\right)$

29. Chizmada $y=f(x)$ **funksiyaning grafigi tasvirlangan bo'lib,** $F(x)$ **uning boshlang'ich funksiyasi. Chizmadan foydalanib,** $F(5)-F(1)$ **ni hisoblang.**



A) 16,5 **B) 14,5** **C) −16,5** **D) 11,5**

30. Hisoblang:

$$\lim_{x\to+\infty}\left(1+\frac{2}{x}\right)^{2x}$$

A) e^2 **B)** e^4 **C)** $\sqrt{e}$ **D) 1**

	0	1	2	3	4	5	6	7	8	9
0		D	A	A	A	B	C	C	A	D
1	D	B	D	C	D	A	D	A	C	D
2	C	B	A	A	C	B	A	B	D	C
3	B									

Maxsus test 9

1. $9\cdot 8^{24}\cdot 625^{17}$ ko'paytma necha xonali son?

A) 70 B) 73 C) 72 D) 71

2. Bo'linuvchi 371, to'liqsiz bo'linma 14 ga teng bo'lsa, bo'luvchi va unga mos qoldiqlar juftligi nechta?

A) 1 B) 2 C) 3 D) 0

3. $y=\sqrt{2x+\sqrt{6x^2+1}}$ funksiyaning qiymati $y=x+1$ funksiyaning qiymatiga teng bo'ladigan x ning barcha qiymatlari yig'indisini toping.

A) -2 B) 0 C) 2 D) 1

4. $\frac{2\sqrt{6}-1}{\sqrt{2}+\sqrt{3}+\sqrt{6}}$ ifodani soddalashtiring

A) $\sqrt{2}-\sqrt{3}+\sqrt{6}$ B) $\sqrt{2}-\sqrt{3}-\sqrt{6}$

C) $\sqrt{2}+\sqrt{3}-\sqrt{6}$ D) $\sqrt{2}+\sqrt{3}+\sqrt{6}$

5. Funksiya nechta nuqtada aniqlanmagan?

$$f(x)=\frac{1+\dfrac{1-x}{1+\dfrac{1+3x}{1-3\cdot\dfrac{1-x}{1+3x}}}}{1-3\cdot\dfrac{1+\dfrac{1-x}{1+3x}}{1-3\cdot\dfrac{1-x}{1+3x}}}$$

A) 4 B) 2 C) 1 D) 3

6. Soddalashtiring:

$$\sqrt{6+2\sqrt{2}\sqrt{3-\sqrt{\sqrt{2}+\sqrt{12}+\sqrt{18-\sqrt{128}}}}}$$

A) $1+\sqrt{3}$ B) $\sqrt{3}-1$ C) $2+\sqrt{2}$ D) $2-\sqrt{2}$

7. Hisoblang:

$$\log_p \log_p \underbrace{\sqrt[p]{\sqrt[p]{\ldots\sqrt[p]{p}}}}_{n\ ta}$$

A) n B) $p\cdot n$ C) $-n$ D) n^p

8. Tengsizlikni yeching:

$$\frac{x+2}{3x+1}\le\frac{x-2}{2x-1}$$

A) $\left(-\infty;-\frac{1}{3}\right)\cup\left[0;\frac{1}{2}\right]$ B) $\left(-\infty;\frac{1}{2}\right]\cup[8;+\infty)$
C) $\left(-\infty;-\frac{1}{3}\right)\cup[8;+\infty)$
D) $\left(-\infty;-\frac{1}{3}\right)\cup\left[0;\frac{1}{2}\right)\cup[8;+\infty)$

9. Tengsizlikni yeching:

$$-2x^2(x+3)^7\left(24x^2+14x-5\right)^3\left(2x^2+x+3\right)\le 0$$

A) $\left[-3;-\frac{5}{6}\right]\cup(2;+\infty)$ B) $\left[-3;-\frac{5}{6}\right]\cup\left[\frac{1}{4};+\infty\right)$
C) $\left[-3;\frac{1}{4}\right]\cup(2;+\infty)$
D) $\left[-3;-\frac{5}{6}\right]\cup\{0\}\cup\left[\frac{1}{4};+\infty\right)$

10. Ushbu

$$\frac{2x}{|x-3|}\le|x|$$

tengsizlikning eng katta manfiy butun yechimi x_0 bo'lsa, $1-x_0$ ni toping.

A) 3 B) 2 C) 4 D) 5

11. Tenglama nechta yechimga ega?

$$\sqrt{1+x+\sqrt{6x-3}}+\sqrt{1+x-\sqrt{6x-3}}=\sqrt{6}$$

A) 2 B) 1 C) 3 D) *cheksiz ko'p*

12. a parametrning qanday qiymat(lar)ida

$$\sqrt{\frac{3}{2}x-a}=a-x$$

tenglama yagona yechimga ega bo'ladi?

A) $a\ge 0$ B) $a\le 0$ C) $0\le a<6$ D) $a>0$

13. Tenglamani yeching:

$$2x(1-\lg 5)=\lg\left(4^x+2x-6\right)$$

va $\frac{x+3}{2}$ ni toping.

A) 3 B) 2 C) 1,5 D) 4

14. Tengsizlikni yeching:

$$\log_{\frac{1}{3}} x>\log_x 3-\frac{5}{2}$$

A) $(0;1)\cup\left(\sqrt{3};9\right)$ B) $\left(1;\sqrt{3}\right)\cup\left(\sqrt{3};9\right)$
C) $(-\infty;1)\cup\left(1;\sqrt{3}\right)$ D) $(0;1)\cup\left(\sqrt{3};+\infty\right)$

15. $y=\cos\frac{1}{2x}$; $y'\left(\frac{1}{\pi}\right)=?$

A) 0 B) -1 C) $\frac{\pi^2}{2}$ D) $-\frac{\pi^2}{2}$

16. Dekart koordinatalar tekisligida

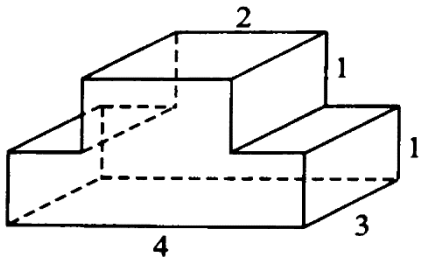
$$|x+2y|\le 2,\quad |y|\le 1,\quad 2x-y\ge 0$$

chiziqlar bilan chegaralangan sohaning yuzini toping.

A) 2 B) 3 C) 4 D) 5

17. Chizmada tasvirlangan ko'pyoq sirtining yuzini toping. Bunda uning barcha ikkiyoqli burchaklari to'g'ri burchakli.

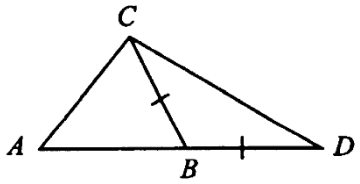
A) 48
B) 50
C) 52
D) 46



18. ABC uchburchakda $\angle A=48°, \angle C=62°$. AB to'g'ri chiziqning B nuqtasidan davomida CB

kesmaga teng BD kesma qo'yildi. BCD uchburchakda D burchakni toping.

A) 35°
B) 70°
C) 58°
D) 31°



19. Hisoblang:

$$\text{ctg}70° + 4\cos 70°$$

A) $\sqrt{2}$ B) $\frac{\sqrt{3}}{2}$ C) 0 D) $\sqrt{3}$

20. Tenglamaning eng kichik musbat ildizi x_0 bo'lsa, $2x_0 + \frac{\pi}{4}$ ni toping:

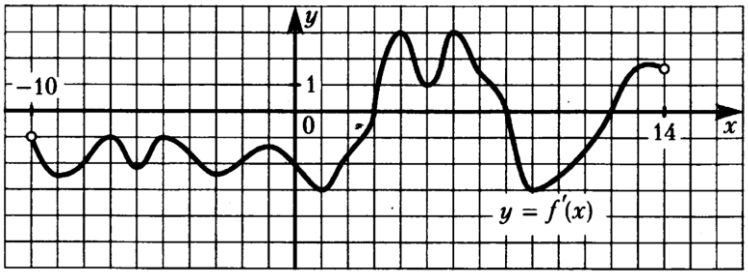
$$\text{ctg}x - 2\sin 2x = 1.$$

A) π B) $\frac{\pi}{4}$ C) $\frac{\pi}{2}$ D) $\frac{5\pi}{4}$

21. $\left(x^2 + \frac{a}{x}\right)^m$ binom yoyilmasining to'rtinchi va o'n uchinchi hadlarining koeffitsiyentlari o'zaro teng. Yoyilmaning x qatnashmagan hadi topilsin.

A) $3003a^{10}$ B) $3002a^9$ C) $1001a^{10}$
D) $3003a^9$

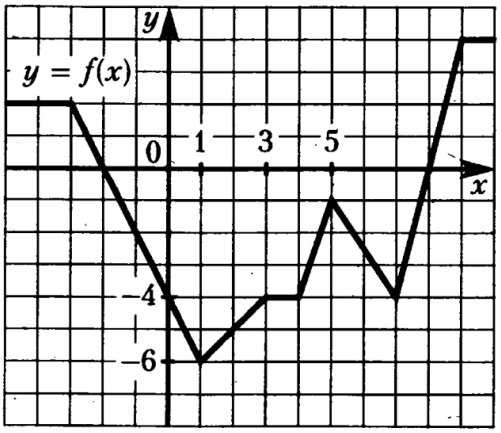
22. Chizmada $(-10;14)$ oraliqda aniqlangan $y = f(x)$ funksiya hosilasi $y = f'(x)$ ning grafigi tasvirlangan. $f(x)$ funksiyaning $[-8;11]$ kesmadagi maksimum nuqtalari sonini toping.



A) 1 B) 6 C) 2 D) 3

23. Chizmada $y = f(x)$ funksiyaning grafigi tasvirlangan bo'lib, $F(x)$ uning boshlang'ich funksiyasi. Chizmadan foydalanib, $F(8) - F(-3)$ ni hisoblang.

A) $-33{,}5$ B) 33,5 C) 31,5 D) $-31{,}5$



24. Tengsizlikni yeching:

$$\text{ctg}x - \text{tg}x - 2\text{tg}2x - 4\text{tg}4x < \frac{8\sqrt{3}}{3}$$

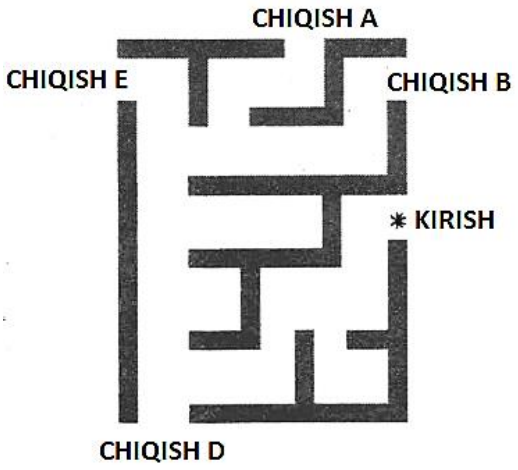
A) $\left(-\frac{\pi}{12} + \frac{\pi n}{8}; \frac{\pi n}{8}\right), n \in \mathbb{Z}$
B) $\left(-\frac{\pi}{12} + \frac{\pi n}{8}; \frac{\pi n}{8}\right), n \in \mathbb{N}$
C) $\left(-\frac{\pi}{6} + \frac{\pi n}{8}; \frac{\pi n}{8}\right), n \in \mathbb{Z}$
D) $\left(-\frac{\pi}{6} + \frac{\pi n}{8}; \frac{\pi n}{8}\right), n \in \mathbb{N}$

25. Trigonometrik tengsizliklar sistemasini yeching:

$$\begin{cases} \sin x \le \frac{\sqrt{3}}{2} \\ \cos x < \frac{\sqrt{3}}{2} \\ 0 \le x < 2\pi \end{cases}$$

A) $\left(\frac{\pi}{6}; \frac{\pi}{3}\right] \cup \left[\frac{2\pi}{3}; \frac{11\pi}{6}\right)$ B) $\left[\frac{2\pi}{3}; \frac{11\pi}{6}\right)$ C) $\left(\frac{\pi}{6}; \frac{\pi}{3}\right]$
D) $\left[\frac{\pi}{6}; \frac{\pi}{3}\right) \cup \left(\frac{2\pi}{3}; \frac{11\pi}{6}\right]$

26. Rasmda labirint tasvirlangan. O'rgimchak labirintning «KIRISH» qismidan harakatlana boshladi. Agar u orqaga qaytmasa va har bir yo'ldan faqat bir marta o'tishi mumkin bo'lsa, o'rgimchakning labirintning A joyidan chiqishi ehtimolini toping.



A) $\frac{1}{64}$ B) $\frac{1}{32}$ C) $\frac{1}{512}$ D) $\frac{1}{1024}$

27. Tengsizlikni yeching:

$$2\arcsin x > \operatorname{arctg} x$$

A) $(0;1)$ B) $(0;1]$ C) $\left(\frac{1}{2};1\right]$ D) $\left(0;\frac{1}{2}\right]$

28. Uchburchakning balandliklari 4, 5 va 6 ga teng. Unga tashqi chizilgan aylana radiusi R uchun quyidagi munosabatlardan qaysi biri to'g'ri?

A) $R > \frac{120}{37}$ B) $R \le \frac{120}{37}$ C) $R > \frac{120}{13}$ D) $R \le \frac{120}{13}$

29. ABCD trapetsiyada $AB||CD$. AD kesmaning o'rtasi M nuqta, $AC \cap BM = K$ hamda AKB uchburchak trapetsiya yuzining $\frac{4}{15}$ qismini tashkil etadi. Trapetsiya asoslari uzunliklarining nisbatini toping.

A) 1:2 B) 2:3 C) 1:4 D) 4:5

30. Hisoblang:

$$\lim_{x\to\infty}\left(\frac{(x+1)^2+(x+2)^2+\cdots+(x+100)^2}{x^2+10^{10}}\right)$$

A) ∞ B) 1 C) 100 D) 0

	0	1	2	3	4	5	6	7	8	9
0		D	B	C	C	B	A	C	D	D
1	B	D	A	A	A	C	C	A	A	D
2	C	A	A	D	A	A	A	B	A	A
3	C									

Harbiy test 1

1. Paskal tilidagi quyidagi dastur ishga tushirilganda xatolik xabarini chiqarmaslik uchun "?" va "??" belgilar o'rniga qo'yish mumkin bo'lgan(mos ravishda) standart funksiyalar juftligini aniqlang:

```
Var a:byte; b:integer;
Begin a:=?(7/2); b:=??(sqrt(100));
write(a;b);
End.
```

A)int,trunc B)abs,int C)round,sqr D)round,trunc

2. $\frac{0{,}625\cdot 6{,}75^2 - 3{,}25^2\cdot 0{,}625}{\sqrt{2{,}75^2+7\cdot 2{,}75+3{,}5^2}}$ ni hisoblang.

A) 0,35 B) 3,5 C)35 D)350

3. Ox o'qdan a marta, Oy o'qdan b marta cho'zish orqali $y=f(x)$ funksiya grafigidan qaysi funksiya grafigi hosil bo'ladi?

A) $y=af(bx)$ B) $y=af\left(\frac{x}{b}\right)$

C) $y=\frac{f\left(\frac{x}{b}\right)}{a}$ D) $y=\frac{f(bx)}{a}$

4. $2^{1+\log_2 3}-3^{\log_4 5}+5^{\log_4 3}-1^{\log_2 3}$ ifodaning qiymatini hisoblang.

A) 1 B) 5 C) 3 D) 7

5. Tengsizlikning eng katta butun va eng kichik butun musbat yechimlari yig'indisini toping.

$$3^{2x}\cdot x^2+5x-6 \le x^2+5x\cdot 3^{2x}-2\cdot 3^{2x+1}$$

A) 4 B) 5 C) 1 D) 6

6. $\alpha = 15°, a = (tg\alpha)^{tg\alpha}, b = (tg\alpha)^{ctg\alpha}, c = (ctg\alpha)^{ctg\alpha}$ bo'lsa, quyidagilardan qaysi biri o'rinli?

A) b>a>c B) c>b>a C) c>a>b D) b>c>a

7. $y = 3\sin 5x + \sin 15x$ funksiyaning hosilasini toping.

A) $-30 \cdot \cos 5x \cdot \sin 10x$ B) $30 \cdot \sin 5x \cdot \cos 10x$

C) $30 \cdot \sin 5x \cdot \sin 10x$ D) $30 \cdot \cos 5x \cdot \cos 10x$

8. Agar

$$f(x) = \begin{cases} x+1, & x < -2 \\ x^2 + 4x, & -2 \le x < 3 \\ 2x+3, & x \ge 3 \end{cases}$$

funksiya berilgan bo'lsa, $f(-4) + f(2) + f(5)$ ning qiymatini toping.

A) 26 B) 22 C) 20 D) 24

9. $f(x) = 30 \cdot \cos x \cdot \sin 4x$ uchun boshlang'ich funksiyani toping.

A) $5cos3x - 3cos5x + C$ B) $5sin3x - 3sin5x + C$

C) $-5cos3x - 3cos5x + C$ D) $5sin3x + 3sin5x + C$

10. Bitta nuqtada kesishadigan 17 ta to'g'ri chiziq tekislikni nechta qismga ajratadi?

A) 32 B) bir qiymatli aniqlab bo'lmaydi

C) 33 D) 34

11. (3;4) nuqta parallel ko'chirish natijasida (2;-2) nuqtaga o'tsa, (1;-5) nuqta qanday nuqtaga o'tadi?

A) (7;-6) B) (0;1) C) (7;-4) D) (0;-11)

12. $\cos(2\arcsin 0,(66))$ ni hisoblang.

A) $\frac{1}{9}$ B) $-\frac{4}{9}$ C) $\frac{7}{9}$ D) $-\frac{2}{3}$

13. $\sin 6x \cdot \cos 2x < \sin 5x \cdot \cos 3x$ trigonometrik tengsizlikni yeching.

A) $\left(\pi k; \frac{\pi}{6} + \pi k\right) \cup \left(\frac{\pi}{2} + \pi k; \frac{5\pi}{6} + \pi k\right); k \in Z$

B) $\left(\frac{\pi}{6} + \frac{2\pi}{3}k; \frac{\pi}{2} + \frac{2\pi}{3}k\right); k \in Z$

C) $\left(\frac{\pi}{6} + \pi k; \frac{\pi}{2} + \pi k\right) \cup \left(\frac{5\pi}{6} + \pi k; \pi + \pi k\right); k \in Z$

D) $\left(-\frac{\pi}{6} + \frac{2\pi}{3}k; \frac{\pi}{6} + \frac{2\pi}{3}k\right); k \in Z$

14. Asoslarining radiuslari 3 va 5 ga teng bo'lgan kesik konus va unga tengdosh silindrning balandliklari bir xil. Silindr asosining radiusini toping.

A) $\sqrt{16\frac{2}{3}}$ B) $7\sqrt{3}$ C) $\sqrt{47}$ D) $\frac{7\sqrt{3}}{3}$

15. $\{x | x \in N, -3 \le x < 5\}$ to'plamning nechta qism- to'plamlari bor?

A) 16 B) 8 C) 4 D) 32

16. Tenglamani yeching:

$$x + \frac{x}{2} + \frac{x}{3} + \frac{x}{4} + \frac{x}{6} + \frac{x}{8} + \frac{x}{12} + 1 = 60$$

A) 20 B) 24 C) 30 D) 19

17. Beshta a_1, a_2, a_3, a_4, a_5 tub sonlar ayirmasi 6 ga teng bo'lgan arifmetik progressiyani tashkil qiladi. $a_2 + a_3$ ni toping.

A) 34 B) 28 C) 22 D) 40

18. $y > 0$ bo'lsin. To'rtburchakning uchlari to'g'ri burchakli Dekart koordinatalar sistemasida quyidagicha berilgan: **A(1;0), B(1;y), C(-7;y), D(-9;0)**. To'rtburchak diagonallari o'rtalari orasidagi masofani toping.

A) 2 B) y ga bog'liq C) $\sqrt{2}$ D) 1

19. To'g'ri burchakli trapetsiyaning bir burchagi 135° ga, o'rta chizig'i 9 sm ga teng. Agar trapetsiyaning asoslari nisbati 1:8 ga teng bo'lsa, trapetiyaning eng katta tomoni uzunligi topilsin.

A) 14 B) $14\sqrt{2}$ C) 16 D) 20

20. $y = 1 - x^2, y = -x - 1$ chiziqlar bilan chegaralangan shaklning yuzini toping.

A) 2,5 B) $8\frac{2}{3}$ C) 5,5 D) 4,5

21. Agar

$$|x + 2| = \frac{x}{2} + a$$

tenglama bitta yechimga ega bo'lsa, a ning qiymatini toping.

A) 1 B) 3 C) 2 D) 0

22. $\cos\left(\frac{\pi - 4x}{2}\right) = \sin(x^2 - 1)$ tenglamaning butun sonlardan iborat ildizlari nechta?

A) 2 B) 3 C) 1 D) 0

23. Agar $a + b + c = 7$ va $\frac{1}{a+b} + \frac{1}{b+c} + \frac{1}{a+c} = \frac{7}{10}$ bo'lsa, $\frac{c}{a+b} + \frac{a}{b+c} + \frac{b}{a+c}$ son nimaga teng?

A) $\frac{19}{10}$ B) $\frac{9}{7}$ C) $\frac{3}{2}$ D) $\frac{17}{10}$

24. Ifodani soddalashtiring:($a > 0$)

$$\left(\frac{\sqrt{(a-5)^2 + 20a}}{\sqrt{a} + \frac{5}{\sqrt{a}}} - \frac{1}{\sqrt{a}}\right) \cdot \sqrt{a}$$

A) $a + 1$ B) $2a$ C) a D) $a - 1$

25. $x^3 - (\sqrt{3} + 1)x^2 + 3$ ko'phadni ko'paytuvchilarga ajrating.

A) $(x - \sqrt{3})(x^2 + x - \sqrt{3})$

B) $(x + \sqrt{3})(x^2 - x + \sqrt{3})$

C) $(x - \sqrt{3})(x^2 - x - \sqrt{3})$

D) $(x + \sqrt{3})(x^2 + x + \sqrt{3})$

26. Hisoblang:

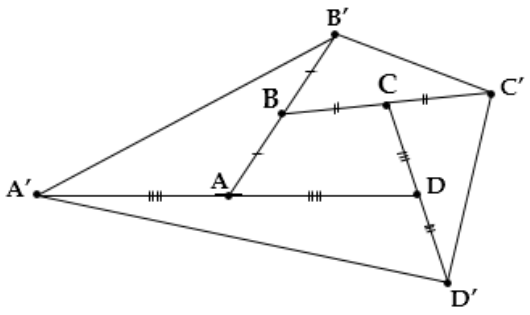
$$(1 + \text{tg}8°)(1 + \text{tg}9°)(1 + \text{tg}36°)(1 + \text{tg}37°)$$

A) 2 B) 8 C) 4 D) 16

27. $\frac{18}{x^4+39}$ ifodaning eng katta qiymati bilan $x^6 + 52$ eng kichik qiymati ko'paytmasining $\frac{1}{12}$ qismini toping.

A) -1,5 B) 1,5 C) 2 D) -2

28. ABCD to'rtburchakning har bir tomono chizmada ko'rsatilgandek o'z uzunligiga teng uzunlikda davom ettirilgan. Agar A'B'C'D' to'rtburchak yuzasi 20 ga teng bo'lsa, ABCD to'rtburchak yuzini toping.



A) 7,5 B) 3 C) 4 D) 5

29. 10 kartochkada 1 dan 10 gacha sonlar yozilgan (har bir kartochkada 1 tadan). Tasodifan olingan kartochkada 3 son bo'lish ehtimolini toping.

A) 0,1 B) 0,4 C) 0,3 D) 1/3

30. Hakim bobo qarib qolganligi sababli hovlisidagi 108 qop yong'oqni omborga tashish uchun nevaralarini ishga chaqirdi. Nevaralar kelib juft-juft bo'lib bo'linishdi va har bir juftlikka 3 ta qop to'g'ri keldi. Hikmat boboning nechta nevarasi bor?

A) 86 B) 72 C) 36 D) 48

31. Eng kichik axborot o'lchov birligini ko'rsating.

A) bod B) bayt C) belgi D) bit

32. Quyidagi mantiqiy tenglamaning yechimlari sonini aniqlang:

$$\neg A \wedge \neg B \vee C = \text{rost}$$

A) 4 B) 5 C) 3 D) 1

33. Aniq bir predmet sohasi bo'yicha masalalar yechishga mo'ljallangan dasturlar majmuasi bu — …

A) tizim(sistema)li dasturiy ta'minot
B) dasturlar yaratish vositalari
C) amaliy dasturiy ta'minot
D) yordamchi dasturiy ta'minot

34. Paskal tilining quyidagi takrorlash operatoridagi takrorlanishlar sonini aniqlang.

I:=2014; While I<=1997 do I:=I-1;

A) 1 B) 18 C) 17 D) 0

35. MS Excel. A1=8; B1=-10; D1=30 bo'lsa,

=ABS(СРЗНАЧ(A1:D1))=12 natija hosil bo'lishi uchun C1 katakda qanday son bo'lishi kerak?

A) -20 B) 16 C) -40 D) -76

36. Agar x, y sonlar uchun

$$x^3 + 4x^2y + axy^2 + 3xy - bx^cy + 7xy^2 + dxy + y^2 = x^3 + y^2$$

ayniyat o'rinli bo'lsa, $a + b + c + d$ ni toping. $(c > 1)$

A) 2 B) -4 C) -1 D) -3

Harbiy test 2

1. MS Excel. A1=10; B1=14; B2=6 bo'lsa, =СУММ(A1-B2;A2-B1) funksiyaning javobi 4 ga teng bo'lishi uchun A2 katakda qanday son bo'lishi kerak?

A) 15 B) 14 C) 16 D) 17

2. HTML-hujjatda matn sarlavhasi nechta daraja (pog'ona) dan iborat bo'lishi mumkin?

A) 5 B) 4 C) 8 D) 6

3. Lotincha "informatio" so'zi nimani anglatadi?

A) xabar berish B) ma'lumotlar, yangiliklar
C) tushuntirish, tavsiflash D) ko'rishni ta'minlash

4. Paskal tilida quyidagi dastur lavhasi bajarilgach **a** o'zgaruvchining qiymatini aniqlang.

a:=5; b:=0; c:=4; c:=a+b*c; a:=3; a:=round(sqrt(1+a+c)); write(a);

A) 5 B) 3 C) 4 D) 2

5. Web brauzerda matnning ko'rinishi quyidagicha bo'lishi uchun uning HTML kodi qanday bo'lishi kerak?

• Bikvadrat tenglama $ax^5 + bx^2 + c = 0$ ko'rinishida bo'lmaydi.

A) <ol type="circle">
<b>Bikvadrat

tenglama<s>ax⁵+bx²+c=0 </s>korinishida bo'lmaydi.
B)
Bikvadrat tenglamaax⁵+bx²+c=0ko'rinishida bo'lmaydi.

C) <ul type="square"><s><cite>Bikvadrat tenglamaax⁵+bx²+c=0ko'rinishida bo'lmaydi</cite></s>

D) <ul type="square">
Bikvadrat tenglamaax⁵+bx²+c=0ko'rinishida bo'lmaydi

6. Operatsion tizim (sistema) lar qaysi bandda to'g'ri ko'rsatilgan?

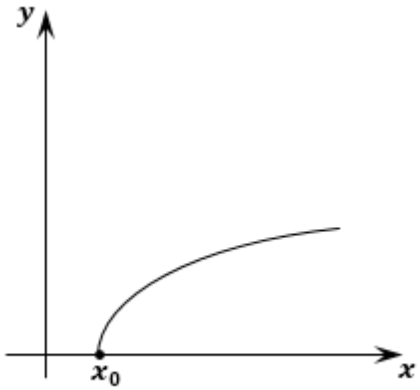
A) UNIX, PS/2, NC B) UNIX, MS DOS, Windows

C) Windows, Opera, Firefox D) Photoshop, DOPPIX

7. $f(x)=\frac{2x}{x-1}$ funksiyaning grafigi qaysi choraklardan o'tadi?

A) I, II, IV B) I, II C) I, III, IV D) I, II, III, IV

8. Rasmda $y=a\sqrt{bx+c}+d$ funksiya grafigi tasvirlangan va $y=0$ uning eng kichik qiymati bo'lsa, quyidagilardan qaysi biri doim o'rinli?



A) $a(c+d)>0$ B) $a(b+d)>0$

C) $a(b+c)>0$ D) $a(c-d)>0$

9. $(-36):\big((-20):(-0{,}8)+(-2{,}5)\cdot(+14)\big)-0{,}5+\frac{1}{6}\cdot\big(6+(-4)+(-8)\big)$ ni hisoblang.

A) 2,1 B) 4,1 C) -5,1 D) 5,1

10. Muntazam parallelepipedning diagonali yon yog'I bilan 30° li burchak tashkil etsa, uning hajmini toping. Parallelepipedning yon yog'ining diagonali $\sqrt{6}$ ga teng.

A) $2\sqrt{6}$ B) 4 C) $4\sqrt{3}$ D) 8

11. Ifodani soddalashtiring:

$$\sin^4\alpha-\cos^4\alpha+\sin 2\alpha$$

A) $\frac{\sqrt{2}}{2}\sin(\alpha-45°)$ B) $\sqrt{2}\sin(45°-\alpha)$

C) $\sqrt{2}\sin(2\alpha-45°)$ D) $\sqrt{2}\cos(2\alpha-45°)$

12. Agar $|x+10|=\frac{x}{2}+a$ tenglama ikkita yechimga ega bo'lsa, a ning eng kichik butun qiymatini ayting.

A) 4 B) 5 C) 6 D) 7

13. Tengsizlikni yeching:

$$\frac{(x-5)\sqrt{27+6x-x^2}}{|x+2|}\le 0$$

A) $(-2;5]$ B) $[-3;5]$

C) $[-3;-2)$ D) $[-3;-2)\cup(-2;5]$

14. $a_1,a_2,a_3,\dots,a_8$ ketma-ketlikda ixtiyoriy uchta hadining yig'indisi 40 ga teng. Agar ketma-ketlikning uchinchi hadi 5 ga teng bo'lsa, birinchi va sakkizinchi hadlarining yig'indisi nechaga teng?

A) 5 B) 37 C) 10 D) 35

15. 2589,7 sonini standart shaklda yozing.

A) $258{,}97\cdot 10$ B) $0{,}25897\cdot 10^4$

C) $2{,}5897\cdot 10^3$ D) $25{,}897\cdot 10^2$

16. Korxona chiqargan mahsulotning 15%i oliy navli, 25%i birinchi navli, 40%i esa ikkinchi navli. Qolgan mahsulot sifatsiz hisoblanadi. Tasodifan olingan

mahsulot birligi sifatsiz emasligining ehtimolligini toping.

A) 0,015 B) 0,35 C) 0,8 D) 0,1

17. Ox o'qidan a marta qisish, Oy o'qidan b marta cho'zish orqali $y=f(x)$ funksiya grafigidan qaysi funksiya grafigi hosil qilinadi?

A) $y=af(bx)$ B) $y=af\left(\frac{x}{b}\right)$

C) $y=\frac{f\left(\frac{x}{b}\right)}{a}$ D) $y=\frac{f(bx)}{a}$

18. $y=12\sin\left(2x+\frac{\pi}{4}\right)$ funksiya nechta natural qiymatlarni qabul qiladi?

A) 5 B) cheksiz ko'p C) 12 D) 4

19. Tengsizlikning yechimi bo'lmaydigan eng kichik natural sonni toping:

$$\log_2^4 x-\log_{0,5}^2\frac{x^3}{8}+9\log_2\frac{32}{x^2}<4\log_{0,5}^2 x$$

A) 1 B) 2 C) 8 D) 9

20. Tengsizlikni yeching: $\sqrt{4+3x}<x$

A) $0<x<4$ B) $x\geq 1$ B) $x<4$ D) $x>4$

21. Nuqtadan tekislikka o'zaro perpendikulyar bo'lgan ikkita og'ma o'tkazilgan. Ulardan biri 8 ga, ikkinchisi uning 75% iga va bu nuqtadan tekislikkacha bo'lgan masofa 4,8 ga teng bo'la, ularning tekislikdagi proyeksiylarini toping.

A) 3,2 va 5,8 B) 3,5 va 6,5 C) 3,3 va 6,6 D) 3,6 va 6,4

22. $|x^2-9x+15|=70$ tenglama yechimlari yig'indisini toping.

A) 8 B) 9 C) 7 D) -7

23. $3^2\cdot 3^5\cdot 3^8\cdot\ldots\cdot 3^{3n-1}=27^5$ tenglamani yeching.

A) 3; -10/3 B) 3 C) -10/3 D) -3

24. Agar $\vec{a}(6;8;-10)$ va $\vec{b}(0;-6;8)$ berilgan bo'lsa, $\frac{1}{4}\cdot\vec{a}\cdot\vec{b}$ ni toping. ($\vec{a}\cdot\vec{b}$ –skalyar ko'paytma)

A) -24 B) -32 C) 24 D) -64

25. Ushbu $f(x)=\frac{2x+4}{x^2+4x+3}$ funksiyaning boshlang'ich funksiyasini toping.

A) $\ln(|x+3|\cdot|x+1|)+C$ B) $\ln(x+2)+C$

C) $\frac{2x^2}{(x+1)(x+2)^2}+C$ D) $\ln|x+1|+C$

26. $y=9\cos x-\cos 9x$ funksiyaning hosilasini toping.

A) $18\sin 4x\cdot\cos 5x$ B) $18\sin 4x\cdot\sin 5x$

C) $18\cos 4x\cdot\cos 5x$ D) $-18\cos 4x\cdot\sin 5x$

27. $y=\lg\cos x$ funksiyaning aniqlanish sohasini toping.

A) $\left(2\pi n;\frac{\pi}{4}+2\pi n\right);n\in Z$

B) $\left(-\frac{\pi}{4}+2\pi n;\frac{\pi}{4}+2n\pi\right);n\in Z$

C) $\left(-\frac{\pi}{2}+2n\pi;\frac{\pi}{2}+2n\pi\right);n\in N$

D) $\left(-\frac{\pi}{2}+2n\pi;\frac{\pi}{2}+2n\pi\right);n\in Z$

28. Uchburchakning uchlari to'g'ri burchakli Dekart koordinatalar sistemasida quyidagicha berilgan: **A(0;0)**, **B($\frac{1}{2}$;6)** va **C(1;0)**. Uchburchak yuzini toping.

A) 3 B) $2\sqrt{2}$ C) $2\sqrt{3}$ D) 2

29. $y=2x^3-6x^2-5x+29$ funksiyaning $x=-2$ nuqtadagi urinma tenglamasini toping.

A) $y=43x-75$ B) $y=43x+85$

C) $y=43x+75$ D) $y=43x-85$

30. $|\sin x|-x^2=0$ tenglamaning nechta butun yechimi bor?

A) 2 B) 3 C) 4 D) 1

31. Kvadratlarining ayirmasi 55 ga teng bo'lgan barcha natural sonlar jufligini toping.

A) 8 va 3; 20 va 19 B) 28 va 27

C) 28 va 27; 17 va 18 D) 8 va 3; 28 va 27

32. $\alpha = 7{,}5°, a = (\text{tg}\,\alpha)^{\text{tg}\alpha}, b = (\text{tg}\,\alpha)^{\text{ctg}\alpha}, c = (\text{ctg}\,\alpha)^{\text{tg}\alpha}, d = (\text{ctg}\,\alpha)^{\text{ctg}\alpha}$ bo'lsa, quyidagilardan qaysi biri o'rinli?

A) d>c>a>b B) d>a>c>b C) c>d>a>b D) d>c>b>a

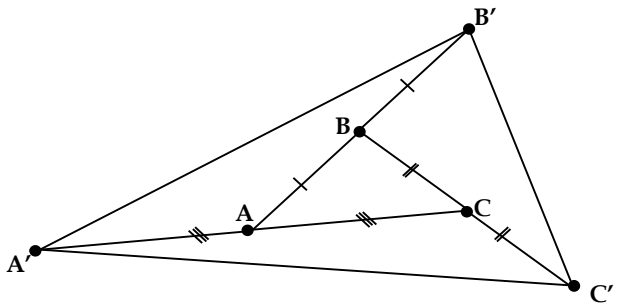
33. $y = \log_2(\sin^2 2x + \cos^2 2x)$ funksiyaning $x = \frac{1}{2}$ nuqtadagi ikkinchi tartibli hosilasining qiymatini toping.

A) 0 B) $\log_2 3$ C) 1 D) $-\log_2 3$

34. $0{,}1 \cdot (10^5)^{x-1} = 5^x \cdot 2^x$ tenglamani yeching.

A) 1,5 B) 3,5 C) 2 D) 2,5

35. ABC uchburchakning har bir tomoni chizmada ko'satilgandek o'z uzunligiga teng uzunlikda davom ettirilgan. Agar A'B'C' uchburchak yuzasi 35 teng bo'lsa, ABC uchburchak yuzasini toping.



A) 7 B) 5 C) 35/4 D) 35/2

36. To'rt nafar yigit va ikki nafar qizdan konsertni olib borishi uchun bitta yigitni va bitta qizni tanlab olish kerak. Bunday ishni nechta usul bilan amalga oshirish mumkin.

A) 12 B) 8 C) 6 D) 10

Harbiy test 3

1. $F(x) = \frac{1}{18}x^6 - \frac{1}{15}x^5 + e^{3x} - \cos\frac{x}{3} + 6$ funksiya quyidagi funksiyalardan qaysi birining boshlang'ich funksiyasi bo'ladi?

A) $f(x) = \frac{1}{3}x^5 - \frac{1}{3}x^4 + 3e^{3x} - \frac{1}{3}\cos\frac{x}{3}$

B) $f(x) = x^5 + x^4 - 3e^{3x} - \cos\frac{x}{3}$

C) $f(x) = \frac{1}{3}x^5 - \frac{1}{3}x^4 + 3e^{3x} + \frac{1}{3}\sin\frac{x}{3}$

D) $f(x) = x^5 - x^4 + 3e^{3x} + 3\cos\frac{x}{3}$

2. Agar $y = -2{,}6x + b$ funksiya grafigi A(1; 0,5) nuqtadan o'tsa, b ning qiymatini toping.

A) 31/5 B) 31/10 C) -21/10 D) 23/10

3. Poyezd 4 minutda 10 kilometr masofani, motosikl 6 minutda 10 kilometr masofani bosib o'tdi. Motosiklchining tezligi poyezd tezligining necha foizini tashkil qiladi?

A) $67\frac{2}{3}\%$ B) $73\frac{1}{3}\%$ C) $66\frac{2}{3}\%$ D) 70%

4. $y = \arcsin\sqrt[6]{3 - 2x - x^2}$ funksiyaning aniqlanish sohasiga tegishli natural sonlar nechta?

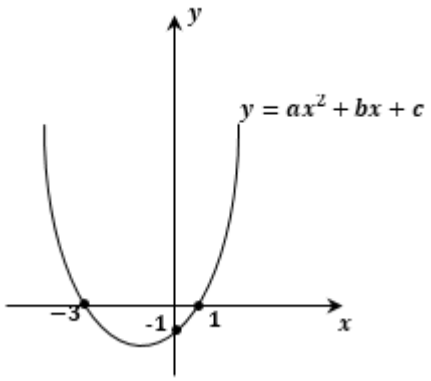
A) 1 B) 2 C) 3 D) 0

5. $|x + 5|^{x^2-1} \geq 1$ tengsizlikni yeching.

A) $[-1; +\infty)$ B) $\emptyset$

C) $[-1; 1]$ D) $(-\infty; -6] \cup [-4; -1] \cup [1; +\infty)$

6. Rasmda $y = ax^2 + bx + c$ funksiyaning grafigi tasvirlangan bo'lsa, berilgan ma'lumotlarga ko'ra $3a + 6b + 2c$ ning qiymatini toping.



A) 2 B) 3 C) -1 D) 1,5

7. Agar $\text{tg}^2\alpha = 3$ bo'lsa, $\cos^2\alpha - \sin^2\alpha$ ni hisoblang.

A) 1/2 B) -1/2 C) -1/4 C) -1/3

8. Parallelepipedning asoslari tomoni 3 ga teng kvadratlardan, barcha yon yoqlari romblardan iborat. Yuqori asosining uchlaridan biri ostki asosining barcha uchlaridan baravar uzoqlikda joylashgan. Parallelepipedning hajmini toping.

A) $27\sqrt{2}$ B) 27 C) $15\sqrt{2}$ D) $13{,}5\sqrt{2}$

9. $x^{\log_x(x+3)^2} = 16$ tenglamani yeching.

A) 1 B) 1; -7 C) $\emptyset$ D) -7

10. $\text{tg}x + \text{tg}\left(\frac{\pi}{4} + x\right) < -2$ trigonometrik tengsizlikni yeching.

A) $\left(-\frac{\pi}{6} + k\pi; \frac{\pi}{4} + k\pi\right) \cup \left(\frac{\pi}{3} + k\pi; \frac{\pi}{2} + k\pi\right); k \in Z$

B) $\left(-\infty; -\frac{\pi}{3} + k\pi\right) \cup \left(\frac{\pi}{4} + k\pi; \frac{\pi}{3} + k\pi\right); k \in Z$

C) $\left(-\frac{\pi}{3} + k\pi; \frac{\pi}{4} + k\pi\right) \cup \left(\frac{\pi}{3} + k\pi; \frac{\pi}{2} + k\pi\right); k \in Z$

D) $\left(-\frac{\pi}{2} + k\pi; -\frac{\pi}{3} + k\pi\right) \cup \left(\frac{\pi}{4} + k\pi; \frac{\pi}{3} + k\pi\right); k \in Z$

11. $\sin\left((-1)^n \frac{\pi}{2}\right)\cos((-1)^n\pi) - (-1)^n$ ni hisoblang. $(n \in Z)$

A) $2(-1)^n$ B) $(-1)^{n+1}$ C) $(-1)^n$ D) $2(-1)^{n+1}$

12. Diagonallarining soni tomonlarining soniga teng bo'lgan ko'pburchakning ichki burchaklari yig'indisini toping.

A) 360° B) 540° C) 720° D) 180°

13. $(x^2 - 1)\sqrt{6 - x - x^2} \le 0$ tengsizlikning manfiy butun yechimlari nechta?

A) 3 B) 1 C) 2 D) 0

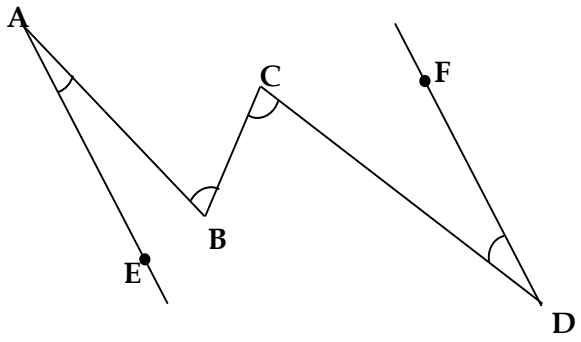
14. $\{x | x \in N, 2 \le x^2 \le 43\}$ to'plamning nechta qism-to'plamlari mavjud?

A) 16 B) 43 C) 32 D) 5

15. Uchburchakning uchlari to'g'ri burchakli Dekart koordinatalar sistemasida quyidagicha berilgan: **A(0;0), B(1;-4), C(1;0).** Uchburchak yuzini toping.

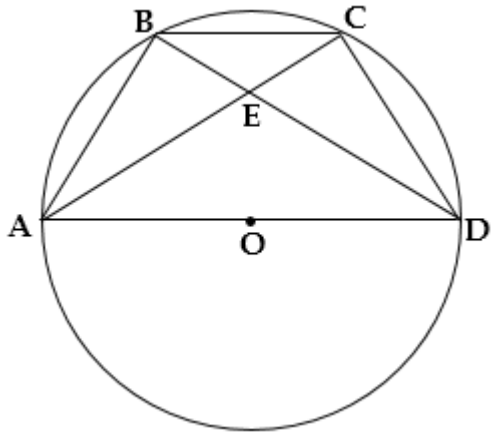
A) 2 B) $2\sqrt{3}$ C) $2\sqrt{2}$ D) 3

16. Rasmda berilgan ma'lumotlarga ko'ra noma'lum D burchakning kattaligini toping. Bu yerda AE∥DF, $\angle A = 35°, \angle B = 65°, \angle C = 2 \cdot \angle D$



A) 35° B) 38° C) 30° D) 15°

17. Teng yonli ABCD trapetsiya O markazli diamteri 10 ga teng bo'lgan aylanaga rasmdagidek ichki chizilgan bo'lib, diagonallari E nuqtada kesishadi va katta asos bilan $\angle EAD = 30°$ li burchak hosil qladi. S_{ABCD} =?



A) $\frac{75\sqrt{3}}{4}$ B) $\frac{225}{2\sqrt{2}}$ C) $\frac{225}{4\sqrt{2}}$ D) $\frac{75\sqrt{3}}{2}$

18. $\sin 80° \sin 40° \sin 20°$ ni hisoblang.

A) $\frac{\sqrt{3}}{16}$ B) $\frac{\sqrt{3}}{2}$ C) $\frac{\sqrt{3}}{8}$ D) $\frac{\sqrt{3}}{4}$

19. arctg3 + arctg2 + arctg1 ni hisoblang.

A) $\frac{\pi}{2}$ B) $\frac{3\pi}{2}$ C) 2π D) π

20. Agar x, y sonlar uchun

$$x^3 + 4x^2y + axy^2 + 3xy - bx^cy + 7xy^2 + dxy + y^2 = x^3 + y^2$$

ayniyat o'rinli bo'lsa, $a + b + c + d$ ni toping. ($c > 1$)

A) 2 B) -4 C) -1 D) -3

21. Amallarni bajaring:

$$\left(-(-p^3)\right)^{11-n} \cdot (p^{n-2})^3$$

A) p^{27-6n} B) $-p^{39}$ C) p^{27} D) $-p^{27}$

22. $\vec{a} = 2\vec{\imath} + 3\vec{\jmath} - \vec{k}$ va $\vec{b} = -2\vec{\imath} - 3\vec{\jmath}$ vektorlar berilgan $|\vec{a} + \vec{b}|$ ni toping.

A) 1 B) $\sqrt{3} - 1$ C) $2\sqrt{2}$ D) $2\sqrt{3}$

23. O'suvchi arifmetik progressiyaning dastlabki uchta hadi yig'indisi 21 ga teng. Bu hadlarga mos ravishda 1; 1; 5 qo'shilsa, geometrik progressiya hosil bo'ladi. Shu geometrik progressiyaning dastlabki 8 ta hadi yig'indisini toping.

A) 1024 B) 1012 C) 1016 D) 1020

24. $x^2 + 14x + y^2 - 10y + 38 = 0$ tenglama bilan berilgan aylana uzunligini toping.

A) 13π B) 12π C) 10π D) 14π

25. $4x^2y + 4xy^2 = 24$ va $x^3 + y^3 = 9$ bo'lsa, $x + y$ ni toping.

A) 3 B) $\sqrt{3}$ C) 9 D) 1

26. Aylanadagi B nuqtadan aylananing radiusiga teng ikkita vatar AB va BC o'tkazilgan. A va C nuqtalar to'g'ri chiziq bilan tutashtirilgan. Aylananing radiusi 10 ga teng bo'lsa, B nuqtadan AC vatargacha bo'lgan masofani toping.

A) 5 B) 4 C) 6 D) 8

27. 0,02032 sonini standart shaklda yozing.

A) $2032 \cdot 10^{-5}$ B) $203{,}2 \cdot 10^{-4}$

C) $2{,}032 \cdot 10^{-2}$ D) $20{,}32 \cdot 10^{-3}$

28. Silindr o'q kesimining yuzi 324 sm^2 ga teng bo'lgan kvadratdan iborat bo'lsa, uning hajmini toping.

A) 1452π B) 1460π C) 1458π D) 1456π

29. Uchburchakning ikkita burchagi mos ravishda $38°$ va $52°$ ga teng. Uchinchi burchak uchidan tushirilgan bissektrisa va mediana orasidagi burchakni toping.

A) 10° B) 14° C) 7° D) 17°

30. Qirralari 12, 14 va 16 ga teng parallepiped qirrasi 1 ga teng bo'lgan kubchalardan tashkil topgan. Parallepipeddan kubcha qalinligidagi tashqi sirtni olib tashlash uchun nechta kubcha olinishi kerak?

A) 1008 B) 543 C) 1004 D) 1012

31. ASCII kodlar jadvalida qandaydir belgi 12-ustun va 11-satrlarning kesishmasida yotadi. Shu belgining ikkilikdagi kodini aniqlang.

A) 10111010 B) 10101011 C) 11001011 D) 10111100

32. Informatika o'rganadigan asosiy ashyoni aniqlang.

A) kompyuter B) dastur C) axborot D) algoritm

33. $n(n \in N)$ bit yordamida necha xil rangni kodlash mumkin?

A) n B) 2^n C) $2^n - 1$ D) $2n$

34. Word 2003 dasturida matematik formulalar yozish … orqali amalga oshiriladi.

A) WordArt B) Microsoft Equation 3.0

C) ClipArt Gallery D) Diagramma ustasi

35. MS Excel. D4 katakchadagi =A4*$D5+C$4 formulaning E7 katakchadagi nusxasini aniqlang.

A) =B7*$D8+D$4 B) =B7*$E8+D$7

C) =C7*$E8+E$4 D) =A4*$E5+C$7

36. Quyidagi axborot hajmini hisoblang (qo'shtirnoq hisobga olinmasin):

"2014 is the year of the healthy child"

A) 37 bayt B) 38 bayt C) 40 bayt D) 42 bayt

Harbiy test 4

1. $3\cos 2x - 3\sqrt{3}\sin 2x > 0$ trigonometrik tengsizlikni yeching.

A) $\left(-\frac{\pi}{12} + k\pi; \frac{5\pi}{12} + k\pi\right); k \in Z$

B) $\left(-\frac{5\pi}{12} + k\pi; \frac{5\pi}{12} + k\pi\right); k \in Z$

C) $\left(-\frac{5\pi}{12} + k\pi; \frac{\pi}{12} + k\pi\right); k \in Z$

D) $\left(-\frac{\pi}{12} + k\pi; \frac{\pi}{12} + k\pi\right); k \in Z$

2. $|x-2|^{10x^2-3x-1} = 1$ tenglamani yeching.

A) 0,2; 0,5; -1 va 3 B) -0,2; 0,5; 1 va 3

C) 0,2; -0,5; -1 va -3 D) -0,2; -0,5; 1 va 3

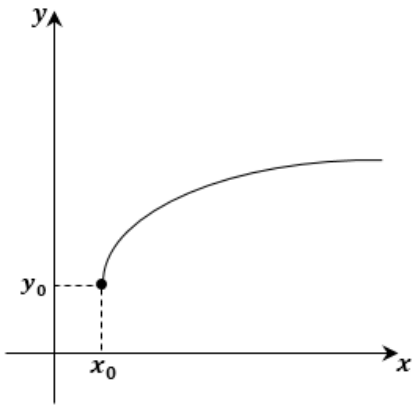
3. $\log_{x+2}(1+2x) = \log_{\sqrt{1+2x}}(2x^2+5x+2) - 1$ tenglamaning ildizi x_0 bo'lsa, $\left(\sqrt{17}+5\right)\cdot x_0$ ni hisoblang.

A) -2 B) 1 C) -1 D) 2

4. Trapetsiyaning asoslari 5 va 3 ga teng. Trapetsiyaning asoslariga parallel bo'lib, uning yuzini teng ikkiga bo'luvchi kesmaning uzunligini toping.

A) 6 B) 4 C) $\sqrt{17}$ D) $\sqrt{15}$

5. Rasmda $y = a\sqrt{bx+c} + d$ funksiyaning grafigi tasvirlangan. Quyidagilardan qaysi biri doimo o'rinli? (y_0 – funksiyaning eng kichik qiymati)



A) $bc > d$ B) $ab < d$ C) $abc > d$ D) $bc < ad$

6. Uchta tanga tashlanmoqda. Ikkita gerb va bitta raqam tushish ehtimolini toping.

A) 1/3 B) 3/2 C) 0,375 D) 0,125

7. $\sin 2x + 9\cos^2 x - 1 \le 0$ tengsizlik x ning qanday qiymatlarida o'rinli?($x \in [0; 2\pi]$)

A) $[\text{arctg}2; \pi]$

B) $[\pi + \text{arctg}4; 2\pi - \text{arctg}2]$

C)$[\text{arctg}4; \pi - \text{arctg}2] \cup [\pi + \text{arctg}4; 2\pi - \text{arctg}2]$

D) $[\text{arctg}4; \pi - \text{arctg}2]$

8. Besh nafar chilangar va ikki nafar elektriklardan bitta chilangar va bitta elektrikdan iborat juftlikni tuzish kerak. Bu ishni necha usul bilan amalga oshirish mumkin?

A) 8 B) 6 C) 12 D) 10

9. Ifodani soddalashtiring: $(a \cdot b \cdot (a+b) \neq 0)$

$$\frac{\sqrt[3]{a^5b^{-1}} - \sqrt[3]{a^{-1}b^5}}{\sqrt[3]{a^2b^{-1}} + \sqrt[3]{a^{-1}b^2}}$$

A) $a^{-1}+b^{-1}$ B) 1 C) $a-b$ D) $a^{-1}-b^{-1}$

10. Diagonallari o'zaro perpendikulyar bo'lgan teng yonli trapetsiyaning yuzasi 289 ga teng. Uning balandligini toping.

A) 17 B) 13 C) 19 D) 15

11. $y=\frac{1}{\sqrt{x}}, y=0, x=1, x=9$ chiziqlar bilan chegaralangan shaklning yuzini toping.

A) 5 B) 8 C) 6 D) 4

12. Uchburchakning uchlari to'g'ri burchakli Dekart koordinatalari sistemasida quyidagicha berilgan: A(0;0), B(a;0), C(0;a). o'tkir burchaklari medianalari orasidagi medianalari orasidagi o'tmas burchak kosinusini toping.

A) -4/5 B) -3/5 C) -3/7 D) a ga bogliq

13. $\log_2(4{,}5-2x)(12+x-x^2)>0$ tengsizlikning butun yechimlari yig'indisini toping.

A) 2 B) 5 C) -2 D) -5

14. Tenglamaning ildizlari yig'indisini toping.

$$\sqrt{14+10x+5x^2}+\sqrt{7+6x+3x^2}=4-2x-x^2$$

A) $\emptyset$ B) -2 C) -1 D) -3

15. Perimetri 4 ga, o'tkir burchagi 30° ga va shu burchak qarshisidagi tomoni $\sqrt{3}$ ga teng bo'lgan uchburchakka ichki chizilgan doira yuzini toping.

A$\left(97-56\sqrt{3}\right)\pi$) B) $\frac{2-\sqrt{3}}{2}\pi$ C) $\frac{2+\sqrt{3}}{2}\pi$ D) $\left(97+56\sqrt{3}\right)\pi$

16. Agar $f(x)=ax^7+bx^3-2$ funksiya uchun $f(4)=-2$ shart bajarilsa, $f(-4)$ qiymatni toping.

A) -1 B) 1 C) bir qiymatli aniqlanmaydi D) -2/

17. Prizmaning qirralari soni 63 ga teng bo'lsa, uning yoqlari sonini toping.

A) 63 B) bir qiymatli aniqlab bo'lmaydi C) 21 D) 23

18. C nuqta AB kesmaning o'rtasi. AC va BC kesmalarda mos ravishda M, N nuqtalar shunday olinganki, AM:MC=CN:NB munosabat bajariladi. Agar AB kesma uzunligi 24 ga teng bo'lsa, MN kesma uzunligini toping.

A) 8 B) 16 C) 18 D) 12

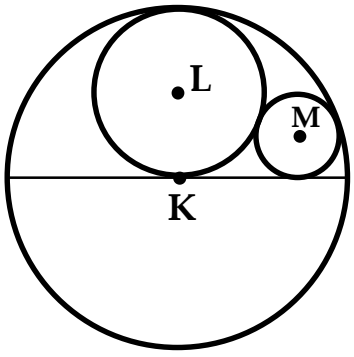
19. Uchta mergan nishonga bir martadan o'q uzmoqda. Ularning nishonga tekkazish ehtimolliklari mos ravishda 90%, 80% va 70% ga teng. Uchalasi ham nishonga tegish ehtimolligini toping.

A) 0,504 B) 0,5 C) 0,006 D) 0,3

20. $2\cdot 3^{2x-1}-5\cdot 3^{x-1}=441$ tenglamani yeching.

A) 1 B) 5 C) 3 D) 6

21. AB kesma K aylananing diametri bo'lsin. L aylana K aylanaga hamda AB to'g'ri chiziqqa K aylananing markazida urinadi; M aylana K va L aylanaga hamda AB to'g'ri chiziqqa urinadi (chizmaga qarang). Agar M doira yuzasi 2 ga teng bo'lsa, K doira yuzasini toping.



A) 24 B) 28 C) *aniqlab bo'lmaydi* D) 32

22. Agar $\lg 5 = a$ va $\lg 3 = b$ bo'lsa, $\log_{30} 8$ ni toping.

A) $\frac{3(1-a)}{1+b}$ B) $1+b$ C) $3(1-a)(1+b)$ D) $1-a$

23. Ox o'qidan a marta qisish, Oy o'qidan b marta qisish orqali $y = f(x)$ funksiya grafigidan qaysi funksiya grafigi hosil qilinadi?

A) $y = af(bx)$ B) $y = af\left(\frac{x}{b}\right)$

C) $y = \frac{f\left(\frac{x}{b}\right)}{a}$ D) $y = \frac{f(bx)}{a}$

24. $y = 28\sin\left(2x + \frac{\pi}{4}\right)$ funksiya nechta natural qiymatlarni qabul qiladi?

A) 5 B) *cheksiz ko'p* C) 12 D) 28

25. $\lg(1 + 4x^2 - 4x) - \frac{1}{2}\lg(5 + x^2) = \lg(1 - 2x)$ tenglama ildizlari ko'paytmasini toping.

A) -2/3 B) -4/3 C) 2 D) 2/3

26. Ox o'qidan a birlik o'ngga, Oy o'qidan b birlik yuqoriga surish orqali $y = f(x)$ funksiya grafigidan qaysi funksiya grafigi hosil qilinadi?

A) $y = f(x + a) + b$ B) $y = f(x - a) + b$

C) $y = f(x - a) - b$ D) $y = f(x + a) - b$

27. $y = \cos\left(\sqrt{4 - x^2} + 2\right)$ funksiyaning qiymatlari sohasini toping.

A) $[-1; 1]$ B) $[\cos 2\,; \cos 4]$

C) $[-1; \cos 2]$ D) $[-1; \cos 4]$

28. $x - m + 3 = (m - 2)|x + 1|$ tenglama m ning qanday qiymatlarida yagona yechimga ega?

A) $m = 3$ B) $m = 2$ C) $m = 6$ D) $m = -1$

29. Akvariumning bo'yi 110 sm, eni 70 sm, balandligi 60 sm. Suv stahi yuqoridan 10 sm pastda bo'lishi uchun akvariumga necha litr suv quyish kerak?

A) 452 B) 38,5 C) 385 D) 512

30. 6 ta katakdan ikkitasi qizil rangga, qolgan to'rtta katak esa oq, qora, yashil va ko'k rangga (har biri bitta rangga) bo'yalishi kerak. Bunday ishni necha usul bilan amalga oshirish mumkin?

A) 120 B) 360 C) 180 D) 100

31. Hisoblash vositalari kelib chiqishining to'g'ri ketma-ketligini ko'rsating.

A) perfokarta, abak, disketa, shaxsiy kompyuter
B) EHM, paskalina, abak, cho't
C) IBM, perfokarta, cho't, logarifmik lineyka
D) abak, cho't, paskalina, EHM

32. $\neg(A \wedge \neg B) \wedge B$ mulohazaga teng kuchli mulohazani ko'rsating.

A) B C) $\neg A$ C) $\neg A \vee B$ D) $\neg A \vee \neg B$

33. ASCII kodlar jadvalining quyi chap burchagidagida joylashgan belgining o'nlikdagi kodini aniqlang.

A) 15 B) 16 C) 240 D) 24

34. Paskal tilida 50 ta elementdan iborat haqiqiy turdagi chiziqli massiv to'g'ri tasvirlangan javobni ko'rsating.

A) Var K: array[5..45] of real;
B) Var C: array[5..54] of integer;
C) Var B: array[2..51] of real;
D) Var F: array[1..50] of Boolean;

35. MS Excel. A1=10, B1=14, B2=6 bo'lsa, =МИН(A1-B2;A2-B1) funksiyaning natijasi 2 ga teng bo'lishi uchun A2 katakda qanday son bo'lishi kerak?

A) 15 B) 18 C) 17 D) 16

36. Operatsion sistema(tizim)ni faollashtiruvchi dastur –

A) Total Commander B) Boot Record C) BIOS
D) Command.com

Harbiy test 5

1. $a = \text{tg}\frac{3\pi}{7}$, $b = \sin\frac{\pi}{6}$ va $c = \text{tg}\frac{5\pi}{7}$ sonlari uchun quyidagi munosabatlardan qaysi biri o'rinli?

A) c>a>b B) b>c>a C) a>b>c D) c>b>a

2. $\frac{9}{5-\sqrt{7}} + \frac{22}{7+\sqrt{5}} - \frac{1}{\sqrt{7}+\sqrt{5}}$ amallarni bajaring.

A) $\sqrt{7} - \sqrt{5}$ B) 6 C) 12 D) 1

3. Savatda «kombinatorika» so'zini tashkil qiladigan harflar yozilgan kartochkalar yotibdi. Tasodifan olingan kartochkada «k» harfi bo'lish ehtimolini toping.

A) 13 B) 2/13 C) 1/13 D) 1/26

4. Yuzi 32 ga, unga ichki chizilgan aylana radiusi 4 ga teng bo'lgan to'gri burchakli uchburchakning gipotenuzasini toping.

A) 4,5 B) 4 C) 3,5 D) 5

5. $5x + 2\sqrt{x^2 + 2{,}5x + 2{,}5} = -2x^2 - 1$ tenglamani yeching.

A) -1 va -1,5 B) 1 va 1,5 C) -1,5 D) 1

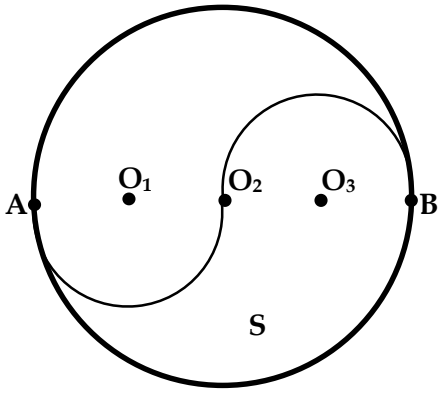
6. Agar $f(x) = 3^x \cdot x$ bo'lsa, $f'(x) = 0$ tenglamani yeching.

A) $-\log_3 e$ B) $\ln 3$ C) 0 $\log_3 e$

7. k ning qanday qiymatida $y = kx - 1$ to'g'ri chiziq $x^2 + y^2 - 2x = 0$ aylanaga urinadi?

A) -2 B) 0 C) 1 D) -1

8. Rasmda AB katta aylana diametri, O_2 katta aylana markazi, O_1 va O_3 kichik aylanalar markazlari bo'lib, ular uchun **AO_2:O_1O_2=O_1O_3:O_3B** tenglik o'rinli. S soha perimetrini ifodalaydigan sonning shu soha yuzini ifodalaydigan songa nisbati **2:3** kabi bo'lsa, O_1O_3 ni toping.



A) 12 B) 6 B) 18 C) 9

9. Funksiyaning aniqlanish sohasini toping.

$$y = \sqrt[7]{8 - 2x - x^2}$$

A) $(-\infty; +\infty)$ B) $[-3; 2]$ C) $(-\infty; 0]$ D) $[0; +\infty)$

10. Silindrning balandligi H ga teng. Uning yon sirti yoyilganda balandligi bilan diagonali 60° li burchak tashkil qilsa, silindrning hajmini toping.

A) $6\pi H^3$ B) $\frac{3H^3}{2\pi}$ C) $\frac{H^3}{3\pi}$ D) $\frac{3H^3}{4\pi}$

11. ABC uchburchakning A ichki burchagidan o'tkazilgan bissektrisa BC tomonni D nuqtada kesib o'tadi. Bunda AD=BD, AB=12 va AC=16. Uchburchakning BC tomonini toping.

A) $8\sqrt{7}$ B) $16\sqrt{3}$ C) 16 D) $4\sqrt{7}$

12. O'tkir burchagi 60° ga, perimetri $\frac{2}{\sqrt{2-\sqrt{3}}}$ ga teng bo'lgan to'g'ri burchakli uchburchakning yuzini toping.

A) $\frac{3}{\sqrt{3}}$ B) $\sqrt{3} - 1$ C) $2 - \sqrt{3}$ D) $\frac{\sqrt{3}}{3}$

13. Parallepipedning asoslari tomoni $5\sqrt{2}$ ga teng kvadratlardan , barcha yon yoqlari romblardan iborat. Yuqori asosining uchlaridan biri ostki asosining barcha uchlaridan baravar uzoqlikda joylashgan. Parallepipedning hajmini toping.

A) $250\sqrt{2}$ B) 125 C) 270 D) 250

14. Agar $\vec{a}(0,(1);0,(5);0,(7))$ va $\vec{b}(0,(2);0,(4);0,(8))$ berilgan bo'lsa, $9\cdot(|\vec{a}|+|\vec{b}|)$ ni toping.

A) $\sqrt{3}(5-2\sqrt{7})$ B) $\sqrt{3}(2\sqrt{7}-5)$

C) $\sqrt{3}(3+2\sqrt{7})$ D) $\sqrt{3}(5+2\sqrt{7})$

15. $x^2-|5x+6|>0$ tengsizlikni qanoatlantiradigan eng kichik butun musbat va eng katta butun manfiy sonlar ko'paytmasini toping.

A) -30 B) -27 C) -28 D) -24

16. Hadlari musbat bo'lgan geometrik progressiyaning birinchi va uchinchi hadi ko'paytmasi 4 ga, uchinchi va behinchisiniki esa 64 ga teng. Progressiyaning ikkinchi, to'rtinchi va oltinchi hadlari yig'indisini toping.

A) 42 B) 46 C) 40 D) 44

17. $y=\frac{1}{3}x^3+\frac{1}{2}x^2-3x+1$ funksiya grafigining qaysi nuqtasi orqali o'tkazilgan urinma koordinata o'qlarining musbat yo'nalishidan teng kesmalar ajratadi?

A) $\left(-2;\frac{13}{3}\right)$ B) $\left(1;-\frac{1}{6}\right)$ C) $\left(-2;\frac{19}{3}\right)$ D) $\left(1;-\frac{7}{6}\right)$

18. $y=0, x=1$ va $x=4$ to'g'ri hamda **A(1;-3)**, **B(3;-2)** va **C(5;-3)** nuqtalardan o'tuvchi parabola bilan chegaralangan figuraning yuzini toping.

A) 6,75 B) 6,5 C) 7 D) 7,25

19. $\log_4\left(2-\sqrt{x+3}\right)<\cos\frac{5\pi}{3}$ tengsizlikning butun sonlardan iborat nechta yechimi bor?

A) 5 B) 3 C) 6 D) 4

20. $4x+\frac{12x^2+3}{a+1}=\frac{8ax-3}{a+1}$ tenglamaning ildizlari bir-biriga teng bo'ldigan a ning qiymatlari yig'indisini toping.

A) 4 B) 0 C) 6 D) 2

21. Katetlari $2\sqrt{2}$ va 8 ga teng bo'lgan to'g'ri burchakli uchburchakni kichik kateti atrofida aylantirishdan hosil bo'lgan jismning to'la sirtini toping.

A) $(48+64\sqrt{2})\pi$ B) $(64+48\sqrt{2})\pi$

C) $(48+64\sqrt{3})\pi$ D) $(64+48\sqrt{3})\pi$

22. Elektron soat ekranida soat ikkita raqam (00 dan 23 gacha) va minut ikkita raqam (00 dan 59 gacha) ko'rsatadi. 00:01 dan 23:59 gacha bu soat necha marta chapdan o'ngga va o'ngdan chapga o'qiganda bir xil vaqtni ko'rsatadi?

A) 10 B) 15 C) 24 D) 18

23. Agar $\lg 2=0{,}3$; $\lg 3=0{,}5$ va $\lg 6=0{,}8$ bo'lsa, $n=2^{20}\cdot 3^{30}\cdot 6^{60}$ necha xonali son?

A) 70 B) *hisoblab bo'lmaydi* C) 69 D) 72

24. Hisoblang:

$$C_5^2\cdot A_5^3\cdot\frac{1}{P_2}$$

A) 150 B) 200 C) 300 D) 250

25. To'g'ri parallepipedning asosi rombdan iborat bo'lib, parallepiped diagonal kesimlarining yuzlari S_1 va S_2 bo'lsa, parallepiped yon sirtining yuzini toping.

A) $\sqrt{S_1^2+S_2^2}$ B) $2\sqrt{S_1^2+S_2^2}$

C) $\frac{1}{2}\sqrt{S_1^2+S_2^2}$ D) $S_1^2+S_2^2$

26. $22-11a+a^2+(5-a)x+x^2=0$ tenglamaning bitta ildizi 2 dan kichik, ikkinchi ildizi 2 dan katta bo'ladigan a ning barcha qiymatlarini toping.

A) $(-\infty;9]$ B) $(-\infty;+\infty)$ C) $(4;9)$ D) $[4;+\infty)$

27. $y=\cos\frac{2x}{x^2+1}$ funksiyaning qiymatlari sohasini toping.

A) $[-1;1]$ B) $[-\cos 1;\cos 1]$

C) $[-1;-\cos 1]$ D) $[\cos 1;1]$

28. $\frac{5\cdot(-2)^{-2}+\left(\frac{1}{2}\right)^{-4}-\left(\frac{2}{3}\right)^{-2}}{2^{-2}+3^{0}}$ ni hisoblang.

A) -12 B) 13 C) -13 D) 12

29. Integralni hisoblang:

$$\int\left(\frac{1}{\cos^2 2x}+7\right)dx$$

A) $\text{tg}\,2x+7x+\text{C}$ B) $2\text{tg}\,2x-7x+\text{C}$

C) $\frac{1}{2}\text{tg}\,2x-7x+\text{C}$ D) $0{,}5\text{tg}\,2x+7x+\text{C}$

30. Tengsizlikni yeching:

$$\log_{0,5}(4^x-5\cdot 2^x+6)\geq -1$$

A) $[0;1)\cup(\log_2 3\,;2]$ B) $[0;1]$

C) $(0;1)$ D) $(\log_2 3\,;3]$

31. Paskal: quyidagi dasturda yo'l qo'yilgan xatoliklarning miqdorini aniqlang:

```
Program misol;
Var a,b,c: integer; x,y,z: word; a1,x1:
byte;
Begin
    a:=-1.2*pi;
    y:=-3;
    a1:=256;
    x2:=7;
End.
```

A) 4 B) 3 D) 2 D) 5

32. Tenglik o'rinli bo'lishi uchun sonlarning asosi x qanday bo'lishi kerak:

$$26123_x=30333_x-2210_x$$

A) 8 B) 7 C) 6 D) 16

33. MS Excel: A1=5, B3=4 bo'lsa, =СТЕПЕНЬ(A1;B3) ni hisoblang.

A) 625 B) 20 C) 1024 D) 1.25

34. WWW xizmatidan foydalanish uchun qanday dasturlardan foydalaniladi?

A) brauzer B) amaliy C) uskunaviy D) translyator

35. Quyidagi mantiqiy ifoda qiymatini toping:

$$\left(\left(729^{\frac{1}{3}}-1\right)^{\frac{1}{3}}\right)>2\ \vee\neg[(11\cdot 11)>(10\cdot 12)]$$

A) mantiqiy ifoda xato yozilgan

B) sodda mulohazalardan ba'zilarining qiymatlarini aniqlab bo'lmaydi

C) rost

D) yolg'on

36. Axborot saqlovchi vositaning axborot saqlash mumkin bo'lgan eng kichik bo'lagi – …

A) 1 bayt B) 1 klaster C) 1 bit D) 8 bayt

Harbiy test 6

1. $f(x)=\frac{x^3}{3}-x^2-35x+2$ funksiya uchun $f'(x)=0$ bo'lsa, x ni toping.

A) -7 va -5 B) 5 va 7 C) -7 va 5 D) -5 va 7

2. Tengsizlikning butun yechimlari yig'indisini toping.

$$\log_x\frac{10}{x}\geq\log_x\frac{1}{2}$$

A) 231 B) 210 C) 209 D) 144

3. $(x^2+x+16)(16x+16+x^2)=16x^2$ tenglamaning haqiqiy ildizlari ko'paytmasini toping.

A) -16 B) 16 C) -17 D) 17

4. Ox o'qdan a marta cho'zish, Oy o'qdan b birlik yuqoriga surish orqali $y=f(x)$ funksiya grafigidan qaysi funksiya grafigi hosil qilinadi?

A) $y=af(x)+ab$ B) $y=af(x)-ab$

C) $y=af(x)+b$ D) $y=af(x)-b$

5. Aylanaga ichki chizilgan ABCD to'rtburchakning AC va BD diagonallari E nuqtada kesishadi. Agar

AB=3, DC=4, AD=5 va AE:EC=3:4 bo'lsa, BC ni toping.

A) 4 B) 7 C) 5 D) 6

6. "Na'munali uy" qurish uchun ma'lum bir yer maydoni ajratildi. Agar har bir xonadon bir xil to'g'ri to'rtburchak shaklida bo'lsa, va bitta xonadonning uchta tomoni 80 metr uzunlikdagi devor bilan o'ralsa, har bir xonadon uchun ko'pi bilan qancha sotix (100 m^2) yer maydoni ajratilgan?

A) 8 B) 4 C) 10 D) 4

7. Hisoblang:

$$\frac{\sqrt{5-2\sqrt{6}}}{(\sqrt[4]{2}+\sqrt[4]{3})(\sqrt[4]{3}-\sqrt[4]{2})}$$

A) 1/2 B) -1 C) 1 D) 2

8. Hisoblang:

$$\sin\left(2\operatorname{arcctg}\frac{1}{3}\right)$$

A) -1 B) -0,6 C) 0,8 D) 0,6

9. $\sin 2\alpha = \frac{1}{2}$ va $\alpha \in \left(\frac{\pi}{4};\frac{\pi}{2}\right)$ bo'lsa, $\cos 3\alpha$ ni hisoblang.

A) $\frac{\sqrt{2}}{2}$ B) $-\frac{\sqrt{2}}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $-\frac{\sqrt{3}}{2}$

10. Trapetsiyaning asoslari 11 va 5 ga teng. Trapetsiya asoslariga parallel bo'lib, uning yuzini teng ikkiga bo'luvchi kesma uzunligini toping.

A) 8 B) $\sqrt{73}$ C) 9 D) $2\sqrt{7}$

11. $\frac{10}{x^4+24}$ ifodaning eng katta qiymati bilan x^4-15 ning eng kichik qiymati ko'paytmasining $\frac{1}{5}$ qismini toping.

A) 1,25 B) 1 C) -1,25 D) -1

12. $a=-1$ bo'lsa, integralni hisoblang:

$$\int_a^{a+1}(\sin^2 2x+\cos^2 2x)\,dx$$

A) 1 B) $\frac{\sqrt{2}-1}{2}$ C) $2\sqrt{2}$ D) $\sqrt{2}$

13. Hisoblang: $C_8^6 \cdot P_2$

A) 96 B) 48 C) 94 D) 56

14. Uchburchakka radiusi 1,4 bo'lgan ichki chizilgan aylana markazidan uchburchak teksiligiga perpendikulyar tushirilgan bo'lib, uning uchidan uchburchak tomonlarigacha bo'lgan masofa 5 ga teng. Perpendikulyarning uzunligini toping.

A) 4,8 B) 2,8 C) 5 D) 4

15. ABC uchburchakda A burchak to'g'ri. B uchidan AC tomonga BD chiziq o'tkazilgan. AD=1, DC=5 va AB=2. ABD va ACB burchaklar yig'indisini toping.

A) 30° B) 45° C) 60° D) 75°

16. $\sqrt{\sin^4\alpha+4\cos^2\alpha}-\sqrt{\cos^4\alpha+4\sin^2\alpha}$ ifodaning $\alpha=15°$ bo'lganda qiymatini toping.

A) $\sqrt{3}$ B) $\frac{\sqrt{3}}{2}$ C) $-\frac{\sqrt{3}}{2}$ D) $\frac{\sqrt{2}}{2}$

17. Agar $|x-8|=\frac{x}{2}+a$ tenglama a paramaterning nechta natural qiymatida yechimga ega emas?

A) 2 B) 3 C) 1 D) 0

18. a ning qanday qiymatlarida $3-5x=2(2a-3x)$ tenglamaning ildizlari beshdan katta emas?

A) $a\geq 2$ B) $a<2$ C) $a\leq 2$ D) $a<5$

19. To'g'ri burchakli uchburchakda o'tkir burchaklarining medianalari uzunliklari $6\sqrt{5}$ va 15 ga teng. Gipotenuza uzunligini toping.

A) 20 B) 18 C) 21 D) 19

20. $\sqrt{2x^2-8x+9}=x-1$ tenglama nechta butun yechimga ega?

A) 2 B) 3 C) 1 D) 0

21. $2\log_2\left(\sqrt{4x+5}-1\right)>\log_2\left(\sqrt{4x+5}+11\right)$ tengsizlikning yechimi bo'lmaydigan natural sonlar yig'indisini toping.

A) 6 B) 15 C) 10 D) 21

22. $\cos(2\arccos 0,(333))$ ni hisoblang.

A) $\frac{2}{9}$ B) $-\frac{4}{9}$ C) $\frac{2}{3}$ D) $-\frac{7}{9}$

23. 12 ga karrali 403 dan katta bo'lmagan barcha natural sonlar yig'indisini toping.

A) 6732 B) 6708 C) 6756 D) 6720

24. $\log_7(x-5)\,(x^2-19x+88) \geq 0$ tengsizlikni yeching.

A) $[6;8] \cup [11;\infty)$ B) $[6;8]$

C) $[8;11]$ D) $[11;\infty)$

25. Radiusi R ga teng bo'lgan aylanaga tashqi chizilgan muntazam n burchakning tomoni b ga teng bo'lsa, shu aylanaga ichki chizilgan muntazam n burchakning tomonini toping.

A) $\sqrt{R^2+\frac{b^2}{4}}$ B) $\frac{2bR}{\sqrt{4R^2+b^2}}$

C) $\frac{2bR}{\sqrt{4R^2-b^2}}$ D) $\sqrt{R^2-\frac{b^2}{4}}$

26. Savatdagi mevalarning 30%i banan va 60%i olma. Tasodifan olingan meva banan yoki olma bo'lish ehtimolligini toping.

A) 0,18 B) 0,5 C) 0,34 D) 0,9

27. XOY Dekart koordinatalari sistemasida ikkita to'g'ri chiziq berilgan bo'lib, ulardan biri koordianatalar boshi va **A(2;3)** nuqtadan, ikkinchisi **B(0;2)** va **C(1;0)** nuqtalardan o'tishi ma'lum bo'lsa, ular kesishish nuqtasining koordinatalari yig'indisini toping.

A) 4/7 B) 3 C) 6/7 D) 10/7

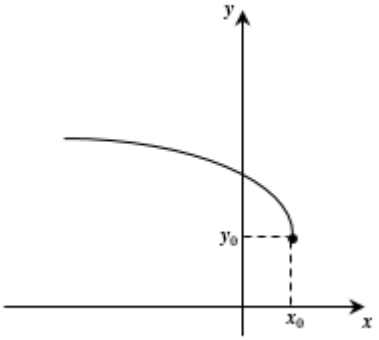
28. $\vec{a}(-5;12)$ vektorning unga yo'nalishdosh bo'lgan birlik vektor bilan skalyar ko'paytmasini toping.

A) 0 B) 5 C) -5 D) 13

29. Qavariq oltiburchakda ichki burchaklar o'zaro teng. Agar **AB=3, BC=4, CD=5, EF=5** bo'lsa, AF va DE tomonlar uzunliklarining o'rta arifmetigini toping.

A) bir qiymatli aniqlab bo'lmaydi B) 5 C) 2 D) 3

30. Rasmda $y = a\sqrt{bx+c}+d$ funksiya grafigi tasvirlangan va $y = y_0$ uning eng kichik qiymati bo'lsa, quyidagilardan qaysi biri doimo o'rinli.



A) $ab < 0$ B) $abc > d$ C) $bc > d$ D) $a > c$

31. 16 bayt necha bitga teng?

A) 160 B) 128 C) 132 D) 164

32. Quyidagi ikkilik sanoq sistemasidagi sonni sakkizlik sanoq sistemasida tasvirlang.

10101111110111101010101

A) 25011545 B) 26101235

C) 25016055 D) 25767525

33. Kompyuterga o'rnatilgan dasturiy ta'minotni o'chirish jarayoni … deyiladi.

A) defragmentatsiya B) installyatsiya

C) deinstallyatsiya D) arxivlash

34. Nashriyot tizim(sistema)larida qaysi dasturlar ishlatiladi?

A) Adobe Page Maker, Latex, Quark Xpress
B) Adobe Page Maker, Latex, MS Word, MS Excel
C) Adobe Page Maker, MS Access, MathCAD
D) Adobe Page Maker, Quark Xpress, MS Excel

35. Raqamli signalni analogli signalga va aksinchaga aylantirib beruvchi qurilma nomini ayting.

A) shifrator B) telefaks C) modem D) deshifrator

36. Paskal tilida quyidagi dastur ishga tushirilganda xatolik xabarini chiqardi.

```
Var a:byte; b:char;
Begin
    a:=5*2; b:='A';
    If a<=15 then a:=sqrt(a-15) else b:='A'; write(a);
End.
```

Xatolikka sabab bo'lgan qismni aniqlang.
A) a:=sqrt(a-15) B) b:='A' C) a:=5*2 D) a<=15

Harbiy test 7

1. Tengsizlikni yeching:

$$\log_7 x - \log_3 7 \cdot \log_3 x > \log_2 0{,}25$$

A) $\left(0; 3^{\frac{2}{\log_3 7 - \log_7 3}}\right)$ B) $\left(1; 3^{\log_7 3}\right)$

C) $\left(3^{\log_7 3}; 3^{\frac{2}{\log_3 7 + \log_7 3}}\right)$ D) $\emptyset$

2. $2^x = a$ bo'lsa, $2^{2^{x+2}}$ ni a orqali ifodalang.

A) 2^{4a} B) 2^a C) $16a^2$ D) $\frac{1}{2^a}$

3. a ning qanday qiymatlarida $y = \sqrt{3}x + 1$ va $y = \sqrt{3}x + a$ to'g'ri chiziqlar orasidagi masofa 0,5 dan kichik bo'ladi.

A) $(1; 3)$ B) $(0; 2)$

C) $(0{,}5; 4)$ D) $\left(-\sqrt{3}; \sqrt{3}\right)$

4. $\sin\frac{\pi}{2} \le \frac{\text{tg}x + \text{tg}3x}{1 - \text{tg}x \cdot \text{tg}3x} \le \text{ctg}\frac{\pi}{6}$ tengsizlikning eng katta va eng kichik yechimlari yig'indisini toping. $\left(\frac{\pi}{12} \le x \le \frac{13\pi}{16}\right)$

A) $\frac{8\pi}{7}$ B) $\frac{43}{48}\pi$ C) $\frac{13\pi}{12}$ D) $\frac{47\pi}{48}$

5. Agar $f(x) = ax$ va $g(x) = x + b$ funksiyalardan $f\big(g(x)\big) = x + 2$ funksiya tuzilgan bo'lsa, $b - a$ ning qiymatini toping.

A) -1 B) 1 C) 3 D) -3

6.

$$\text{ctg}\,6\alpha \cdot \frac{\sin 10\alpha + \sin 2\alpha}{\cos 10\alpha + \cos 2\alpha}$$

ni soddalashtiring.

A) 2 B) 1 C) 6 D) 0

7. To'g'ri to'rtburchakning simmetriya o'qlari $x = 6$ va $y = 4$ bo'lib, uchlaridan biri A(10;6) nuqtada bo'lsa, shu to'rtburchakning perimetrini toping.

A) 28 B) 32 C) 24 D) 20

8. $\sqrt{2x - 100} \cdot \sqrt{100 - x} \ge 0$ tengsizlikning butun yechimlari yig'indisini toping.

A) 3765 B) 3825 C) 3675 D) 3775

9. a ning qanday butun qiymatida $y = -x^2 + 2x + a$ funksiyaning musbat butun qiymatlarining yig'indisi 3 ga teng?

A) 2 B) -1 C) 1 D) 0

10. $a_1, a_2, \dots, a_8$ ketma-ketlikda ixtiyoriy uchta kema-ket hadining yig'indisi 30 ga teng. Agar ketma-ketlikning uchinchi hadi 7 ga teng bo'lsa, birinchi va sakkizinchi hadlarining yig'indisini toping.

A) 7 B) 23 C) 27 D) 14

11. Tenglamani yeching:

$$\sqrt{5} \cdot 5^{\frac{x}{1+\sqrt{x}}} \cdot \left(\frac{1}{5}\right)^{\frac{2+\sqrt{x}+x}{2(1+\sqrt{x})}} = 625$$

A) 81 B) 64 C) 49 D) 36

12. Tengsizlikni yeching:

$$\big(x - 2{,}0(7)\big) \cdot \sqrt{6x - x^2 + 16} \ge 0$$

A) $(2{,}0(7); 8)$ B) $[2{,}0(7); 6)$

C) $\{-2\} \cup [2{,}0(7); 8]$ D) $[2{,}0(7); 8]$

13. $\frac{2}{3}\cos 2\pi = \log_{3\sqrt{3}} \frac{1}{x}$ tenglamadan x ni toping.

A) $\sqrt{3}$ B) $\frac{1}{\sqrt{3}}$ C) 3 D) $\frac{1}{3}$

14. $3 \cdot 4^{x^2-x} - 30 \cdot 2^{x^2} + 3 \cdot 2^{2x+4} = 0$ tenglamaning ildizlari ko'paytmasini toping.

A) -3 B) 2 C) 3 D) -4

15. Ox o'qdan 2 marta, Oy o'qdan k marta cho'zish orqali $y = f(x)$ funksiya grafigidan qaysi funksiya grafigi hosil qilinadi?

A) $y = 2f\left(\frac{x}{k}\right)$ B) $y = 2f(kx)$

C) $y = \frac{f(kx)}{k}$ D) $y = \frac{f\left(\frac{x}{k}\right)}{2}$

16. 6 nafar mehmonni 6 ta stulga o'tqizish variantlari nechta?

A) 6 B) 180 C) 720 D) 300

17. $\sqrt[3]{x^{\log_3 \sqrt[3]{x}}} > 3$ tengsizlikning yechimi bo'lmaydigan eng katta natural sonning $\frac{1}{3}$ qismini toping.

A) 9 B) 10 C) $\frac{28}{3}$ D) 8

18. $x^2 + \frac{1}{x^2} - 3\left(x + \frac{1}{x}\right) - 2 = 0$ tenglamaning ildizlari yig'indisini toping.

A) 3 B) 2 C) 1 D) 4

19. m ning qiymatlarida $\frac{m-2x}{2} = \frac{mx-1}{3}$ tenglamaning ildizi mavjud emas?

A) $m = -2$ B) $m = 2$ C) $m = -3$ D) $m = 0$

20. Agar $1 + 2f(x-1) = 2f(x)$ va $f(0) = 0$ bo'lsa, $f(2n+2), n \in N$ ni toping.

A) $n+1$ B) $2n+2$ C) n D) $2n+1$

21. Ikki teng yonli uchburchak umumiy asosga ega bo'lib, ularning tekisliklari o'zaro 60° li burchak hosil qiladi. Umumiy asos 16 sm, bir uchburchakning yon tomoni 17 sm, ikkinchisining yon tomonlari o'zaro perpendikulyar. Uchburchaklarning uchlari orasidagi masofani toping.

A) 13 sm B) 11 sm C) 14 sm D) 15 sm

22. Diagonallari 16 va 26 ga, ular orasidagi o'tkir burchagi 30° ga teng bo'lgan parallelogrammning yuzini toping.

A) 98 B) 104 C) 102 D) 107

23. Soddalashtiring:

$$\operatorname{tg}(-3{,}1\pi) \cdot \cos(-9{,}9\pi) - \sin 5{,}6\pi \cdot \operatorname{ctg} 4{,}4\pi$$

A) $\sqrt{2}$ B) $\frac{\sqrt{2}}{2}$ C) 0 D) 1

24. Tengsizlikni yeching:

$$1 \geq \left|\frac{2 - 3x + x^2}{x - 1}\right|$$

A) $[1;5]$ B) $(1;3)$ C) $(1;5]$ D) $(1;3]$

25. Geometrik progressiyada $n-$ hadi $b_n = \frac{\sqrt{3}}{2} \cdot 5^{n-1}$ ga teng. Pogressiyaning maxrajini toping.

A) 0,2 B) -5 C) 0,5 D) 5

26. Agar barcha x va y lar uchun

$$x^3 + 4x^2y + axy^2 + 3xy - bx^cy + 7xy^2 + dxy + y^2 = x^3 + y^2$$

ayniyat bajarilsa, $|a+b+c|(b-c-d)$ ni toping. $(c > 1)$

A) 5 B) -2 C) 2 D) -4

27. $y = \cos 2\pi + 4\cos^4 x - 4\cos^2 x$ funksiyaning eng kichik musbat davrini toping.

A) 2π B) $\frac{3\pi}{2}$ C) $\frac{\pi}{2}$ D) π

28. To'g'ri burchakli uchburchakning bir kateti 18 ga teng. Uning nedianalari kesishish nuqtasidan ikkinchi katetgacha bo'lgan masofani toping.

A) 4 B) 6 C) 5 D) 8

29. Radiusi 6 ga teng doiradan markaziy burchagi 60° teng doiraviy sektor qirqib olindi va unga aylana ichki chizildi, ya'ni aylana sektor tomonlariga va yoyiga urinadi. Shu aylanaga ichki chizilgan muntazam uchburchak yuzini toping.

A) $3\sqrt{3}$ B) $\frac{7\sqrt{3}}{4}$ C) $\frac{10\sqrt{3}}{3}$ D) $4\sqrt{3}$

30. Integralni hisoblang:

$$\int_2^3 \frac{4x}{x-1}dx$$

A) 4 B) $4\ln 4e$ C) $4\ln(3e^3)$ D) $4\ln 2e$

31. Qaysi javobda faqat qobiq dasturlar keltirilgan.

A) Norton Commander, MS DOS, Volkov Commander
B) Total Commander, Norton Commander
C) Vista, DOS3.3, Total Commander
D) Linux, Norton Commander

32. Qanday aloqa tarmog'i Internet tarmog'ining yaratilishiga asos bo'lib hisoblangan.

A) ARPANet B) IntraNet C) InfoNet D) WWW

33. Quyidagi mantiqiy tenglamaning yechimlari sonini aniqlang.

$$\neg A \vee \neg B \wedge A = \text{rost}$$

A) 1 B) 2 C) 3 D) 4

34. Faqat arxivlangan fayllar kengaytmasi berilgan javobni ko'rsating.

A) zip, jpg, rar B) zip, rar, arj

C) htm, arj, txt D) avi, com, bac

35. Paskal tilidagi quyidagi dastur lavhasi bajarilgach b o'zgaruvchi qiymatini aniqlang.

x:=-1; y:=-1; a:=0.1; IF (x*x+y>0) AND (a=1/10) THEN b:=true ELSE b:=false;

A) false B) -1 C) true D) 0

36. ASCII kodlar jadvalining markazida joylashgan belgining sakkizlikdagi kodini aniqlang.

A) 210 B) 167 C) 77 D) 170

Harbiy test 8

1. Agar $\sqrt{13+y^3}-\sqrt{y^3-14}=3{,}375$ bo'lsa, $\sqrt{13+y^3}+\sqrt{y^3-14}$ ning qiymatini toping.

A) 16 B) 12 C) 11,375 D) 8

2. $\dfrac{\left(0,(3)+\frac{1}{2}\right)-\left(\frac{1}{4}-\frac{1}{5}\right)}{\left(\frac{1}{6}+\frac{1}{4}\right)+\left(\frac{1}{10}-\frac{1}{8}\right)}$ ni hisoblang.

A) 2 B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 1

3. $a^2>|a|>a$ va $3-a+2x+x^2=0$ bo'lsa, javoblardan qaysi biri to'g'ri?

A) tenglama ikkita manfiy yechimga ega
B) tenglama bitta yechimga ega
C) tenglama yechimga ega emas
D) tenglama ikkita musbat yechimga ega

4. 11…1 soni 7 ga bo'linsa, shu sonni 11 ga bo'lgandagi qoldiqni toping.

A) 5 B) 3 C) 1 D) 0

5. a ning nechta butun qiymatida

$$\frac{a^4-16}{a^3-4a}:\frac{a^3+4a}{a+7a^2}$$

ifodaning qiymati butun son bo'ladi?

A) 2 ta B) 0 ta C) 1 ta D) 3 ta

6. Kamayuvchi geometrik progressiya tashkil etuvchi uchta sondan uchinchisi 24 ga teng. Agar uchinchi son o'rniga 18 olinsa, shu uchta son arifmetik progressiya tashkil etadi. Birinchi sonni toping.

A) 63 B) 36 C) 50 D) 54

7. $|x^2+5x+6|\le x^2+5x+6$ tengsizlikni yeching.

A) $\{-3;-2\}$ B) $[-3;-2]$

C) $(-\infty;-3]\cup[-2;+\infty)$ D) $(-3;-2)$

8. Integralni hisoblang:

$$\int_1^3 (3-|x-2|)\,dx$$

A) 1 B) 0 C) 5 D) 2

9. a ning qanday qiymatida $ax^6+x^5-4x^2+4$ ko'phadni $(x+1)$ ga bo'lgandagi qoldiq 2 ga teng bo'ladi?

A) 0 B) 3 C) -5 D) 4

10. Bir gektar ko'kalamzor bir yil davomida havoni 70 tonna changdan tozalashga qodir. Umumiy maydoni 16000 ga bo'lgan ko'kalamzor bir yilda havoni necha tonna changdan tozalaydi?

A) 1120000 B) 1220000 C) 112000 D) 1670000

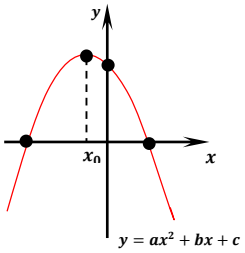
11. $\overline{2014xy}$ ko'rinishidagi 6 xonali sonlar orasida 36 ga qoldiqsiz bo'linadiganlari nechta?

A) 2 ta B) 3 ta C) 0 ta D) 1 ta

12. Markazlari orasidagi masofa 13 sm, radiuslari 7 sm va 2 sm bo'lgan aylanalarga umumiy urinma o'trkazilgan. Urinish nuqtalari orasidagi masofa (sm) topilsin.

A) 12 B) 10 C) 9 D) $\sqrt{194}$

13. Rasmda $y=ax^2+bx+c$ kvadrat funksiya grafigi tasvirlangan. quyidagilardan qaysi biri doim noto'g'ri? $(\mathcal{D}=b^2-4ac)$



A) $a^2\mathcal{D}^3-c^4b^5>0$

B) $ac-b^2\mathcal{D}>0$

C) $b^2a^3-c^4\mathcal{D}^5<0$

D) $a^3b^4c^5-\mathcal{D}^6<0$

14. Ikki sonning ayirmasi 11,142 ga teng. Agar sonlarning kichigidagi vergulni o'ng tomonga bir xona surilsa, sonlarning kattasi hosil bo'ladi. Sonlarning kattasini toping.

A) 14,82 B) 13,21 C) 12,38 D) 10,6

15. Agar $a=3$ va $b=5$ bo'lsa, $\sqrt[3]{a^b+b^a-152}$ ni hisoblang.

A) 4 B) 5 C) 3 D) 6

16. Quyidagi qaysi tengsizliklar o'rinli (to'g'ri)?

1) $2^{300}<3^{200}$; 3) $\sqrt[3]{0{,}01}>\sqrt[3]{0{,}001}$

2) $\pi^{-\sqrt{3}}<\left(\frac{1}{\pi}\right)^{-\sqrt{3}}$; 4) $\left(\frac{2}{3}\right)^{1+\sqrt{6}}>\left(\frac{2}{3}\right)^{\sqrt{2}+\sqrt{3}}$

A) 2, 3, 4 B) 1, 3, 4 C) 1, 2, 4 D) 1, 2, 3

17. Tenglamani yeching:

$$2^{\frac{2-x}{2x+1}}=2^{\frac{3x-1}{2x+1}}-1$$

A) 5 B) 3 C) 1 D) 2

18. $\sqrt{x^2-7}=\sqrt{x^2+9}-2$ tenglamani yeching.

A) 4 B) -4 C) 3 D) ±4

19. Ifodani soddalashtiring:

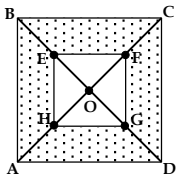
$$\frac{x^3-4x^2+2x+1}{x^3-6x^2+8x+3}$$

A) $\frac{x-1}{x-3}$ B) $\frac{x-1}{x+3}$ C) $\frac{x+1}{x+3}$ D) $\frac{x+1}{x-3}$

20. Agar x_n ketma-ketlik uchun $x_n=\frac{1-n}{n}-(-1)^n$ bo'lsa, x_4-x_3 ni toping.

A) $-\frac{1}{6}$ B) $\frac{1}{6}$ C) $-2\frac{1}{12}$ D) $2\frac{1}{12}$

21. ABCD kvadratning tomoni 1 ga teng. AH=OH, BE=EO, CF=FO, DG=GO bo'lsa, shtrixlangan sohaning yuzini toping.



A) $\frac{1}{4}$ B) $\frac{3}{4}$ C) $\frac{2}{3}$ D) $\frac{1}{2}$

22. Muntazam to'rtburchakli piramida asosining tomoni 12 ga, apofemasi 10 ga teng. Piramida hajmini toping.

A) 387 B) 384 C) 382 D) 380

23. $\mathcal{A}(5;12)$ nuqtaning Ox o'qqa nisbatan simmetrik bo'lgan nuqtasidan $\mathcal{B}(-1;-4)$ nuqtagacha bo'lgan masofani toping.

A) 50 B) $\sqrt{10}$ C) $\sqrt{50}$ D) 10

24. Tenglamaning ildizlari yig'indisini toping:

$$\sqrt{x^2-4x+5}+\sqrt{\sqrt{2x^2-8x+17}}=4$$

A) 4 B) 1 C) 3 D) 2

25. a ning qanday qiymatida $2x+y-4a+7=0$ va $2x+y+a+13=0$ to'g'ri chiziqlar orasidagi msofa $\frac{a^2}{\sqrt{5}}$ dan katta bo'lmaydi?

A) $(-\infty;-3]\cup[-2;-1]\cup[6;+\infty)$

B) $[-3;-2]\cup[-1;6]$

C) $(-\infty;-3)\cup(-2;-1)\cup(6;+\infty)$

D) $(-3;-2)\cup(-1;6)$

26. $-2<x\leq 0$ oraliqda $y=x^2+2x-3$ funksiya qanday qiymatlar qabul qiladi?

A) $-4<y<-3$ B) $-4\leq y<-3$

C) $-4\leq y\leq -3$ D) $-4<y\leq 0$

27. Assimptotalaridan biri $y=2$ bo'lgan va $\mathcal{N}(0;-2)$, $\mathcal{M}(-1;0)$ nuqtalardan o'tuvchi giperbolaning ordinatasi $y=3$ nuqtasining absissasini toping.

A) 5 B) -5 C) 4 D) 6

28. a parametrning qanday qiymatlarida

$$(3a-1)x^2+2ax+3a-2=0$$

tenglama ikkita har xil haqiqiy ildizlarga ega bo'ladi?

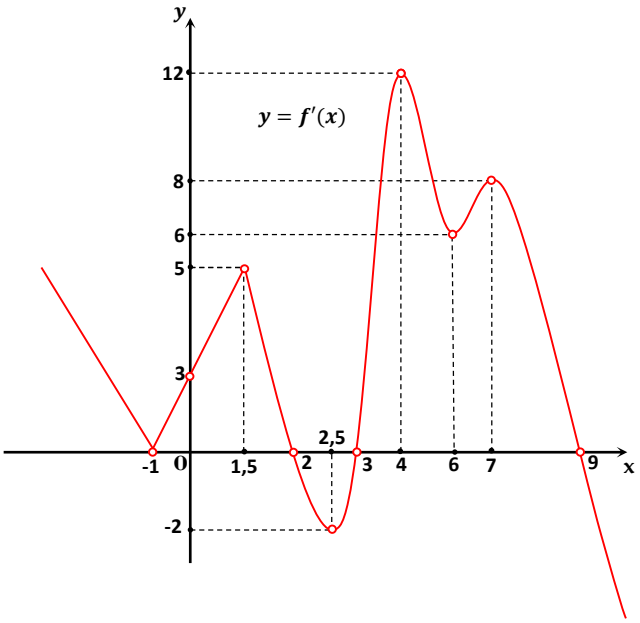
A) $\left(\frac{9-\sqrt{17}}{16};\frac{9+\sqrt{17}}{16}\right)$ B) $\left(\frac{9-\sqrt{17}}{16};\frac{1}{3}\right)\cup\left(\frac{1}{3};\frac{9+\sqrt{17}}{16}\right)$

C) $\left(\frac{9-\sqrt{17}}{15};\frac{9+\sqrt{17}}{15}\right)$ D) $\left(\frac{9-\sqrt{17}}{15};\frac{1}{3}\right)\cup\left(\frac{1}{3};\frac{9+\sqrt{17}}{15}\right)$

29. Uchburchakning uchlari $(5;-1),(3;4)$ va $(1;2)$ nuqtalarda joylashgan. Shu uchburchak medianalar kesishgan nuqtasining koordinatasini toping.

A) $(3;3)$ B) $\left(3;\frac{5}{3}\right)$ C) $(3;2)$ D) $(2;3)$

30. Quyida $y=f(x)$ funksiya hosilasining grafigi tasvirlangan. Unga ko'ra $y=f(x)$ funksiyaning statsionar nuqtalarini toping.



A) $-1;\ 1{,}5;\ 2{,}5;\ 4;\ 6$ B) $-1;\ 2;\ 3;\ 9$

C) $-1;\ 1{,}5;\ 2{,}5;\ 4;\ 6;\ 7$ D) $-2;\ 0;\ 3;\ 5;\ 6;\ 8;\ 12$

31. Quyidagi o'nlik sanoq sistemasidagi sonni ikkilik sanoq sistemasida tasvirlang:

1397

A) 10101000111 B) 10101110111

C) 10101110101 D) 10101010101

32. MS Access dasturining asosiy obyektlarini aniqlang.

A) Jadval, so'rov, ma'lumot, tugma, makros, modul
B) Jadval, so'rov, forma, hisobot, makros, modul
C) Jadval, servis, forma, fayl, makros, modul
D) Matn, rasm, forma, hisobot, makros, modul

33. Faqat antivirus dasturlari yozilgan javobni ko'rsating

A) Mc Afee, MS DOS
B) Nod 32, Aidtest
C) AVP Platinium, MS Access
D) Borland Delphi, Norton Antivirus

34. Paskal tilidagi quyidagi dastur qismining bajarilishi natijasida ekranga chiqariuladigan axborotni aniqlang:

a:='Uzbekistan'; k:=length(a); write(k, a);

A) 10Uzbekistan B) k=10 C) Uzbekistan10
D) 10 Uzbeksitan

35. Rim sanoq sistemasida quyidagi amalni bajaring:

XXILVC+MDIIXVM

A) MMDCLXIX B) MMVCLXIX

C) MCDCLXIX D) MDDCLIXX

36. MS Excel: A1=50, B1=4, C1=12, A2=5, B2=12, C2=-12 bo'lsa,

=СЧЁТЕСЛИ(A1:C2;"<12")

formulaning natijasini aniqlang.

A) 3 B) 4 C) 2 D) 5