

**MATEMATIKA (INFORMATIKA BILAN)**

1. Hisoblang:

$$\frac{1 \cdot 2 \cdot 3 + 3 \cdot 6 \cdot 9 + 5 \cdot 10 \cdot 15 + 7 \cdot 14 \cdot 21}{2 \cdot 4 \cdot 6 + 6 \cdot 12 \cdot 18 + 10 \cdot 20 \cdot 30 + 14 \cdot 28 \cdot 42}$$

- A)
- $\frac{1}{2}$
- B)
- $\frac{1}{16}$
- C)
- $\frac{1}{4}$
- D)
- $\frac{1}{8}$

2. Oybek ikkita masalani 36 minutda yechdi. U birinchi masalani yechishga ikkinchisini yechishga qaraganda 6 minut ko'p vaqt sarfladi. Oybek ikkinchi masalani necha minutda yechgan?

- A) 21 B) 15 C) 18 D) 20

3. 110 soni 10, 14, 18, ... arifmetik progressiyaning nechanchi hadi?

- A) 25 B) 26 C) 24 D) 27

4. Hisoblang:  $\operatorname{tg}\left(\operatorname{arctg}2 - \operatorname{arctg}\frac{1}{2}\right)$ 

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

5. Hisoblang:  $\arcsin(\sin 3)$ 

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

6. Agar  $\log_{27} a = b$  bo'lsa,  $\log_{\sqrt[6]{a}} \sqrt{3}$  ni toping.

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

7.  $\frac{2^{3n-4} \cdot 2^{5+6n}}{2^{1+3n}}$  ni soddalashtiring.

- A)
- $2^{6n+1}$
- B)
- $4^{3n}$
- C)
- $4^{3n-1}$
- D)
- $2^{3n}$

8. Agar  $2^x = 152$  bo'lsa,  $|x - 8| + |x - 6|$  ifodani soddalashtiring.

- A) 2 B)
- $14 - 2x$
- C)
- $2x - 14$
- D)
- $-2$

9.  $x$  ning qanday qiymatida  $3(2 - x) - 8 = 10$  tenglik o'rinli bo'ladi?

- A)
- $-4$
- B)
- $-6$
- C) 4 D) 6

10.  $x^2 - 4|x| - a + 3 = 0$  tenglamaning  $a \geq 3$  bo'lgandagi ildizlari yig'indisini toping.

- A)
- $-4$
- B) 4 C)
- $-3$
- D) 0

11.  $(x^2 + 14x + 14)(x^2 + x + 14) = 14x^2$  tenglamaning haqiqiy ildizlari yig'indisini toping.

- A)
- $-14$
- B)
- $-15$
- C)
- $-13$
- D)
- $-16$

12.  $x^2 + 5x + 3 \leq 0$  tengsizlikning barcha butun yechimlari yig'indisini toping.

- A)
- $-10$
- B)
- $-14$
- C)
- $-13$
- D)
- $-15$

13. Tengsizlikni yeching:  $\frac{\arccos\left(-\frac{3}{\pi}\right) \cdot \log_{\frac{3}{\pi}} \frac{\pi}{4}}{1 - 2 \log_{\log_2 x} 2} \geq 0$ 

- A)
- $x \in (2; 3) \cup (16; +\infty)$
- 
- B)
- $x \in (1; 2) \cup (18; +\infty)$
- 
- C)
- $x \in (1; 2) \cup (16; +\infty)$
- 
- D)
- $x \in (1; 2) \cup (15; +\infty)$

14.  $y = \frac{1}{2} \sin \frac{x}{2} \cos \frac{x}{2}$  funksiyaning asosiy davrini toping.

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

15.  $y = 5 \sin 9x + 3 \sin 15x$  funksiyaning hosilasini toping.

- A)
- $90 \cos 3x \cos 12x$
- B)
- $-90 \cos 3x \cos 12x$
- 
- C)
- $90 \sin 3x \sin 12x$
- D)
- $-90 \sin 3x \sin 12x$

16.  $y = \cos 3x \cos 12x$  funksiya uchun boshlang'ich funksiyaning toping.

- A)
- $\frac{1}{18} \cos 9x - \frac{1}{30} \cos 15x$
- 
- B)
- $\frac{1}{18} \sin 9x - \frac{1}{30} \sin 15x$
- 
- C)
- $\frac{1}{18} \cos 9x + \frac{1}{30} \cos 15x$
- 
- D)
- $\frac{1}{18} \sin 9x + \frac{1}{30} \sin 15x$

17. Teng yonli uchburchakning uchidagi burchagi  $16^\circ$  ga teng. Yon tomoni bilan asosidagi burchak bissektrisasi tashkil qilgan o'tmas burchakni toping.

- A)
- $139^\circ$
- B)
- $141^\circ$
- C)
- $131^\circ$
- D)
- $123^\circ$

18.  $ABCD$  parallelogrammda  $BD = 6\sqrt{2}$ ,  $\angle ADB = 60^\circ$ ,  $\angle CDB = 75^\circ$  bo'lsa,  $AB$  ni toping.

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

19. Aylanaga ichki chizilgan trapetsiya diagonali yon tomoniga perpendikulyar hamda asosi bilan  $30^\circ$  li burchak tashkil etadi. Shu trapetsiya perimetrining aylana uzunligiga nisbatini toping.

- A)
- $\frac{3}{2\pi}$
- B)
- $\frac{5}{2\pi}$
- C)
- $\frac{2}{\pi}$
- D)
- $\frac{4}{\pi}$

20. Asoslarining radiuslari  $2\sqrt{2}$  va  $11\sqrt{2}$  ga teng bo'lgan kesik konus va unga tengdosh silindrning balandliklari ham o'zaro teng bo'lsa, silindr asosining radiusini toping.

- A)
- $7\sqrt{2}$
- B)
- $5\sqrt{2}$
- C)
- $8\sqrt{2}$
- D)
- $6\sqrt{2}$

21.  $ABCD A_1 B_1 C_1 D_1$  to'g'ri burchakli parallelepipedda  $\overrightarrow{AA_1} = \vec{a}$ ,  $\overrightarrow{AB} = \vec{b}$  va  $\overrightarrow{AD} = \vec{c}$  uchun  $\overrightarrow{AC_1}$  ni  $\vec{a}$ ,  $\vec{b}$  va  $\vec{c}$  vektorlar orqali ifodalang.

- A)  $\vec{a} + \vec{b} + \vec{c}$     B)  $\vec{a} + \vec{b} - \vec{c}$     C)  $\vec{a} + \vec{c} - \vec{b}$   
D)  $\vec{b} + \vec{c} - \vec{a}$

22.  $A = \{1; 3; 5; 6; 8; 10\}$  va  $B = \{5; 6; 7; 8; 10\}$  to'plamlar berilgan.  $A \cup B$  to'plam elementlari sonini toping.

- A) 8    B) 7    C) 11    D) 6

23. Noto'g'ri tengliklarni toping:

- 1)  $\log_a b \cdot \log_a c = \log_a (b + c)$ ;  
2)  $\log_a b + \log_a c = \log_a (b \cdot c)$ ;  
3)  $\log_a b - \log_a c = \log_a (b : c)$ ;  
4)  $\log_a b : \log_a c = \log_a (b - c)$ ;  
5)  $\log_a b : \log_a c = \log_a (b : c)$

- A) 2; 3; 4    B) 1; 2; 4    C) 1; 4; 5    D) 1; 3; 5

24. To'g'ri qoidalarni toping:

1)  $\int \frac{dx}{\sqrt{a^2 - x^2}} = \arccos \frac{x}{a} + C$ ;

2)  $\int \frac{dx}{\sqrt{a^2 - x^2}} = \arcsin \frac{x}{a} + C$ ;

3)  $\int \frac{dx}{a^2 + x^2} = \frac{1}{a} \arctg \frac{x}{a} + C$ ;

4)  $\int \frac{dx}{a^2 + x^2} = -\text{arcctg} \frac{x}{a} + C$ ;

5)  $\int \frac{dx}{a^2 + x^2} = -\frac{1}{a} \text{arcctg} \frac{x}{a} + C$ ;

6)  $\int \frac{dx}{\sqrt{a^2 - x^2}} = -\frac{1}{a} \arccos \frac{x}{a} + C$

- A) 1; 3; 6    B) 1; 2; 4    C) 2; 3; 4    D) 2; 3; 5

25. Quyidagi tasdiqlardan qaysilari to'g'ri?

- 1) uchburchakka tashqi chizilgan aylananing radiusi  $R = \frac{abc}{2S}$  ( $a, b, c$  - uchburchakning tomonlari,  $S$  - uchburchak yuzi) formula bilan hisoblanadi; 2) radiusi  $R$  ga, markaziy burchagi  $\alpha$  ga teng doiraviy sektorning yuzi  $S = \frac{\pi R^2}{360} \alpha$  formula bilan hisoblanadi; 3) tomoni  $a$  ga, burchaklaridan biri  $\alpha$  gateng rombning yuzi  $S = a^2 \sin \alpha$  formula bilan hisoblanadi; 4) diagonallari  $d_1$  va  $d_2$  ga, ular orasidagi burchagi  $\alpha$  ga teng ixtiyoriy qavariq to'rtburchakning yuzi  $S = d_1 d_2 \sin \alpha$  formula bilan hisoblanadi; 5) o'xshash figuralar yuzlarining nisbati ularning mos chiziqli o'lchovlari kvadratlarining nisbatiga teng.

- A) 2; 3; 5    B) 1; 2; 5    C) 1; 3; 5    D) 1; 3; 4

26. Quyida turli sanoq sistemalaridagi sonlar mos qo'yilgan A, B, C va D mulohazalar berilgan (qavs ichida sanoq sistemasi asosi berilgan). Rost mulohazalarga mos sonlarni ikkilik sanoq sistemasida tasvirlang. Yolg'on mulohazalarni qiymatini aynan 0 ga teng deb oling. Ikkilik sanoq sistemasidagi 0 ni Yolg'on, 1 ni Rost sifatida qarab NOT (A AND B OR C) OR D ifodaga mos mantiqiy sxema natijasini aniqlang.

A="Chop etish qurilmasi tarkibiga printer va plotterning ikkalasi kiradi"=10011(2)

B="ENIAC birinchi elektron hisoblash mashinasi hisoblanadi"=21(10)

C="Axborot nazariyasida bir nechta axborot asosida yangi axborot hosil qilish axborotni qayta ishlash deb ham hisoblanadi"=24(8)

D="Kompyuterning barcha turdagi xotirasini foydalanuvchi formatlashi mumkin"=231(4)

- A) 10011    B) 01010    C) 10101    D) 00010

27. Quyida berilgan mulohazalarning qiymatlari asosida EMAS((A YOKI B) VA EMAS C) mantiqiy ifoda qiymatini hisoblang.

A="FAT32, NTFS, LINUX dasturlarining barchasi fayl sistemasi hisoblanadi"

B="O'zbekistonda ishlab chiqarilgan Freeware turidagi dasturlardan biri DOPPIX"

C="Ba'zi dasturlar installyatsiya qilinmaydi".

A) ROST

B) Mantiqiy ifoda xato yozilgan

C) YOLG'ON

D) Ba'zi mulohazalar qiymatini aniqlab bo'lmaydi

28. MS Excel. Agar  $A1 = \text{ДЛСТР}(\text{"MS Word"})$ ,  $A2 = 19$ ,  $B2 = 3 * B1$  va  $=\text{ЕСЛИ}(\text{ИЛИ}(A2 * B1 - B2 > 512; B1 * A1 - A2 > 64); B1^2 - A1; B2^2 - A1)$  formula natijasi 434 bo'lsa, B1 katakka yozish mumkin bo'lgan sonlar yig'indisini aniqlang.

- A) -7    B) 7    C) -21    D) 21

29. Quyudagi ko'rinishdagi web-hujjat berilgan.

Web-hujjatdagi noma'lum X va Y teglari o'rniga yozish mumkin bo'lgan teglar berilgan javobni shunday tanlangki, faqat ikkita, ya'ni tagchiziqli va qalin shrift xususiyatiga ega bo'lgan sonlar yig'indisi 11 ga teng bo'lsin.

```
<html>
<strong><X>1<Y>2</Y>3<Y>4</X>5</strong>
<X>6</Y></X>
</html>
```

- A) X=u, Y=b    B) X=u, Y=p    C) X=u, Y=i  
D) X=br, Y=u

30. Quyida A va B natural sonlarning eng katta umumiy bo'luvchisini hisoblash dasturi berilgan. Dastur faqat to'g'ri natijalar berishi va xotiradan kam joy egallashi uchun qaysi javobda keltirilgan o'zgaruvchilar tavsifi kerak?

```
Begin randomize;
a:=random(255)+1; b:=random(255)+1;
n:=a; m:=b;
while(a<>b) do
    if (a>b) then a:=a-b else b:=b-a;
n:=n*m; m:=n div a;
writeln(m);
End.
```

- A)a:Word; b:Word; n:LongInt; m:LongInt;  
B)a:Byte; b:Byte; n:Integer;m: Integer;  
C)a:Byte; b:Byte; n:Word; m:Word;  
D)a:Word; b:Word; n:Integer; m:Word;

## TO'G'RI JAVOBLAR

№	Javob		№	Javob		№	Javob	
1	D		11	B		21	A	
2	B		12	A		22	B	
3	B		13	C		23	C	
4	A		14	A		24	D	
5	C		15	A		25	A	
6	C		16	D		26	B	
7	B		17	D		27	A	
8	A		18	A		28	D	
9	A		19	B		29	D	
10	D		20	A		30	C	