4-variant 2017 yil spectrum

@axborotnoma

@axborotnoma_bot

1. Shar radiusi 5 marta kattalashtirilsa, uning hajmi necha barobar oshadi?
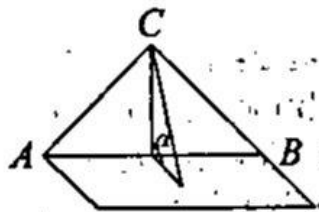
Yechish:

$R_1 = 5R$, $\dfrac{R_1}{R} = 5$, $\dfrac{V_1}{V} = ?$

$$\frac{V_1}{V} = \frac{\dfrac{4}{3}\pi R_1^3}{\dfrac{4}{3}\pi R^3} = \left(\frac{R_1}{R}\right)^3 = 5^3 = 125.$$

Javob: 125.

2. To'g'ri burchakli teng yonli uchburchakning $4\sqrt{2}$ ga teng gipotenuzasi orqali uchburchak tekisligi bilan 60° li burchak tashkil etuvchi P tekislik o'tkazilgan. Uchburchakning P tekislikdagi proyeksiyasi yuzini toping.

Yechish:

ABC – teng yonli to'g'ri burchakli uchburchak.

$AB = c = 4\sqrt{2}$,
$\alpha = 60°$,
S – proeksiya yuzi.

$c^2 = a^2 + a^2 = 2a^2$,

$c = a\sqrt{2} = 4\sqrt{2}$, $a = 4$

$S_\Delta = \dfrac{a^2}{2} = \dfrac{16}{2} = 8$

$S = S_\Delta \cdot \cos\alpha = 8 \cdot \cos 60° = 80 \cdot \dfrac{1}{2} = 4.$

Javob: 4.

3. Qavariq beshburchakning ikkita burchagi 90° ga teng, qolganlarining nisbati esa 3:4:5. Eng katta va eng kichik burchaklarning yig'indisini toping.

Yechish:

$\alpha_1 = 90°$, $\alpha_2 = 90°$ $\to$ $\alpha_3 : \alpha_4 : \alpha_5 = 3:4:5$

$\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 90° + 90° +$
$+ 3x + 4x + 5x = 540°.$

$12x = 360°$, $x = 30°$.

$\alpha_3 = 3x = 90°$

$\alpha_4 = 4x = 120°$

$\alpha_5 = 5x = 150°$

Eng kichik burchak – 90°.
Eng katta burchak – 150°.
$90° + 150° = 240°.$

Javob: 240°.

4. $\begin{cases} x - y = 2 \\ x + y = 4 \end{cases}$ bo'lsa,

$\dfrac{x^2 + xy + y^2}{x^3 - y^3} + \dfrac{x^2 - xy + y^2}{x^3 + y^3}$ ning qiymatini toping.

Yechish:

$\begin{cases} x - y = 2 \\ x + y = 4 \end{cases}$ bo'lsa, $\dfrac{x^2 + xy + y^2}{x^3 - y^3} + \dfrac{x^2 - xy + y^2}{x^3 + y^3}$

1) qisqa ko'paytirish formulasiga asosan:

$\dfrac{x^2 + xy + y^2}{(x - y)(x^2 + xy + y^2)} +$

$+ \dfrac{x^2 - xy + y^2}{(x + y)(x^2 - xy + y^2)} = \dfrac{1}{x - y} + \dfrac{1}{x + y}$

2) $x - y = 2$, $x + y = 4$ bo'lganligi sababli

$$\frac{1}{x-y} + \frac{1}{x+y} = \frac{1}{2} + \frac{1}{4} = \frac{3}{4} = 0,75.$$

Javob: 0,75.

5. 28 va 60 ning eng katta umumiy bo'luvchisi va eng kichik umumiy karralisi ko'paytmasini toping.

Yechish:

1) 28 va 60 sonlarini tub ko'paytuvchilarga ajratamiz.

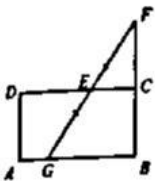$28 = 2^2 \cdot 7$, $60 = 2^2 \cdot 3 \cdot 5$

2) EKUB(28; 60) = 2^2,

EKUK(28; 60) = $2^2 \cdot 3 \cdot 5 \cdot 7$

3) $4 \cdot 20 \cdot 21 = 1680$.

Javob: 1680.

6. ABCD to'g'ri to'rtburchak. GE = EF, AG = 3, GB = 8 bo'lsa, $\frac{S_{BGF}}{S_{DEGA}}$ nisbatni toping.

Yechish:

S_{BGF} to'g'ri burchakli uchburchak.

S_{DEGA} to'g'ri burchakli trapetsiya

GE = EF, AG = 3, GB = 8

$\triangle ECF$ va $\triangle GBF$ o'xshash

$$\frac{FE}{FG} = \frac{EC}{GB} = \frac{FC}{FB}, \quad \frac{1}{2} = \frac{EC}{8}, \quad EC = 4,$$

$FC = CB = x$

$DE = DC - EC = 11 - 4 = 7$

$$\frac{S_{BGF}}{S_{DEGA}} = \frac{\dfrac{8 \cdot 2x}{2}}{\dfrac{3+7}{2} \cdot x} = \frac{8x}{5x} = \frac{8}{5} = 1,6.$$

Javob: 1,6.

7. $x^{lg^2 x - 3lgx + 1} > 1000$ tengsizlikning eng kichik natural yechimini toping.

Yechish:

$x^{lg^2 x - 3lgx + 1} > 1000$ tengsizlikning ikki qismini logarifmlaymiz.

$lg\, x^{lg^2 x - 3lgx + 1} > lg 1000$

$(lg^2 x - 3lgx + 1) \cdot lgx > 3$

$lgx = a$

$(a^2 - 3a + 1) \cdot a > 3$

$a^3 - 3a^2 + a - 3 > 0$

$a(a^2 + 1) - 3(a^2 + 1) > 0$

$(a^2 + 1)(a - 3) > 0$

$a^2 + 1$ – ifoda doimo musbat.

$a - 3 > 0$, $a > 3$, $lgx > 3$, $x > 1000$.

$(1000; \infty)$ tengsizlikning eng kichik natural yechimi 1001.

Javob: 1001.

8. $y = \cos^2 x + 1$ funksiyaning qiymatlar sohasini toping.

Yechish:

I-usul

1) $\cos^2 x = \dfrac{-1 + \cos 2x}{2} = \dfrac{1}{2} + \dfrac{1}{2}\cos 2x$,

$-1 \leq \cos 2x \leq 1$

2) $y_{min} = 0 + 1 = 1$

$y_{max} = 1 + 1 = 2$,

$E(y) = [1; 2]$

II-usul

1) $y = \dfrac{1}{2} + \dfrac{1}{2}\cos 2x + 1 = \dfrac{3}{2} + \dfrac{1}{2}\cos 2x$

2) $y_{min} = \dfrac{3}{2} + \dfrac{1}{2} \cdot (-1) = 1$

$y_{max} = \dfrac{3}{2} + \dfrac{1}{2} \cdot 1 = 2$.

Javob: [1; 2].

9. Axborot-resurs markazida 20 ta kompyuter o'rnatilmoqda, bunda ayrimlari kabel bilan ulanmoqda. Har bir kompyuterdan 6 ta kabel chiqishi lozim bo'lsa, jami nechta kabel kerak?
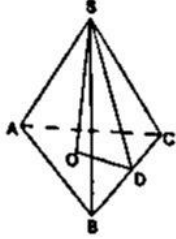
Yechish:

20 ta kompyuter. Har bir kompyuterda 6 ta kabel. Ayrimlari kabel bilan ulangan. Jami hammasi bo'lib $20 \cdot 6 = 120$ ta, agar ayrimlari ulangan bo'lsa 60 ta kabel. Jami 120 ta kabel.

Javob: 120.

10. Qarang: 3-variant 13-savol (22-bet).

11. Muntazam uchburchakli piramidaning balandligi 2 ga, asosi tomoni 12 ga teng. Piramidaning yon sirti yuzini toping.

Yechish:

SABC muntazam uchburchakli piramida.

$AB = a = 12$

$SO = H = 2$

$S_{yon} = ?$

$S_{yon} = \dfrac{P \cdot h_a}{2}$, h_a – apofema. $h_a = SD$

$P = 3a$, $OD = r = \dfrac{a\sqrt{3}}{6} = 2\sqrt{3}$

$h_a = \sqrt{SO^2 + OD^2} = \sqrt{H^2 + r^2} =$

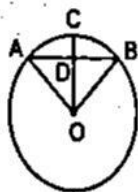$= \sqrt{2^2 + (2\sqrt{3})^2} = \sqrt{16} = 4$.

$S_{yon} = \dfrac{3 \cdot 12 \cdot 4}{2} = 72$.

Javob: 72.

12. Aylananing uzunligi 10 ga teng bo'lgan vatari aylana markazidan 120° burchak ostida ko'rinadi. Ushbu vatar hosil qilgan sohalardan kichkinasining balandligini toping.

Yechish:

$AB = 10$

$\angle AOB = 120°$

$AO = OB = R$

$CD = ?$

1) $\triangle AOB$ teng yonli

$\angle BAO = \angle ABO = 30°$ bundan

$OD = \dfrac{AO}{2} = \dfrac{R}{2}$.

$AD = \dfrac{AB}{2} = \dfrac{10}{2} = 5$.

2) $OC = R$.

$CD = CO - OD = R - \dfrac{R}{2} = \dfrac{R}{2}$.

3) $\sin 60° = \dfrac{AD}{AO}$, $AO = R = \dfrac{5}{\frac{\sqrt{3}}{2}} = \dfrac{10}{\sqrt{3}}$.

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4) $CD = \dfrac{R}{2} = \dfrac{10}{2 \cdot \sqrt{3}} = \dfrac{5}{\sqrt{3}} = \dfrac{5\sqrt{3}}{3}$, $CD = \dfrac{5\sqrt{3}}{3}$.

Javob: $\dfrac{5\sqrt{3}}{3}$.

13. Sistemani yeching va x + y ning qiymatini toping. $\begin{cases} y - 5x = 11 \\ \dfrac{y}{x} = 5,1(2) \end{cases}$

Yechish:

$\begin{cases} y' = 5x = 11 \\ \dfrac{y}{x} = 5,1(2) \cdot x \end{cases} \Rightarrow \begin{cases} y - 5x = 11 \\ y = \dfrac{461}{90}x \end{cases}$

$\dfrac{461}{90}x - 5x = 11$, $11x = 11 \cdot 90$, $x = 90$.

$y = \dfrac{461}{90} \cdot 90 = 461$. (90; 461)

$x + y = 90 + 461 = 551$.

Javob: 551.

14. $(x^2 + x - 2)^2 + (x^2 + x - 2) - 2 = x$ tenglamaning natural yechimlari nechta?

Yechish:

$(x^2 + x - 2)^2 + (x^2 + x - 2) - 2 = x$

$(x^2 + x - 2)^2 + x^2 + x - 2 - 2 - x = 0$

$x^4 + 2x^2(x - 2) + x^2 - 4x + 4 + x^2 - 4 = 0$

$x^4 + 2x^3 - 4x^2 + 2x^2 - 4x = 0$

$x^4 + 2x^3 - 2x^2 - 4x = 0$

$x(x^3 + 2x^2 - 2x - 4) = 0$

$x = 0$

$x^3 + 2x^2 - 2x - 4 = 0$ tenglamaning yechimlari ozod hadi 4 ning bo'luvchilari bo'lishi kerak. ±1, ±2, ±4.

Natural sonlar 1, 2, 4 tenglamani qanoatlantirmaydi.

Tenglama natural yechimga ega emas.

Javob: natural yechimga ega emas.

15. $\dfrac{1}{2} + \dfrac{1}{2+4} + \dfrac{1}{2+4+6} + \ldots + $ $ + \dfrac{1}{2+4+6+8+\ldots+24}$ yig'indini hisoblang.

Yechish:

$$\frac{1}{2}+\frac{1}{2+4}+\frac{1}{2+4+6}+\ldots+\frac{1}{2+4+6+8+\ldots+24}=$$

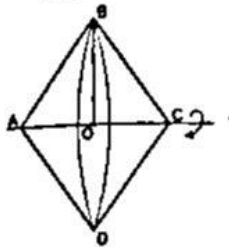$$=\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+\ldots+\frac{1}{156}=\frac{1}{1\cdot2}+$$

$$+\frac{1}{2\cdot3}+\frac{1}{3\cdot4}+\ldots+\frac{1}{12\cdot13}=1-\frac{1}{2}+\frac{1}{2}-$$

$$-\frac{1}{3}+\frac{1}{3}-\frac{1}{4}+\ldots+\frac{1}{12}-\frac{1}{13}=1-\frac{1}{13}=\frac{12}{13}.$$

Javob: $\dfrac{12}{13}$.

16. Teng tomonli uchburchak o'zining a tomoni atrofida aylanadi. Hosil qilingan aylanma jismning hajmini toping.

Yechish:

ABC teng tomonli uchburchak.

AB = BC = AC = a

OB = OD = R konus radiusi

AO = OC = H konus balandligi

$$V_1=\frac{1}{3}\pi\cdot OB^2\cdot AO$$

$$V_2=\frac{1}{3}\pi\cdot OB^2\cdot CO$$

$$V=V_1+V_2=\frac{1}{3}\pi\cdot OB^2\cdot AO+\frac{1}{3}\pi\cdot OB^2\cdot CO=$$

$$=\frac{1}{3}\pi\cdot AC\cdot OB^2$$

$$OB^2=AB^2-AO^2=a^2-\frac{a^2}{4}=\frac{3a^2}{4}$$

$$V=\frac{1}{3}\pi\cdot a\cdot\frac{3a^2}{4}=\frac{\pi a^3}{4}.$$

Javob: $\dfrac{\pi a^3}{4}$.

17. $\begin{cases}\dfrac{1}{x}+\dfrac{4}{y}=\dfrac{1}{2}\\[2mm]\dfrac{2}{x}+\dfrac{3}{y}=\dfrac{4}{5}\end{cases}$ bo'lsa, y ning qiymatini toping.

Yechish:

$$\begin{cases}\dfrac{1}{x}+\dfrac{4}{y}=\dfrac{1}{2}\\[2mm]\dfrac{2}{x}+\dfrac{3}{y}=\dfrac{4}{5}\end{cases}$$ sistemadagi birinchi tenglamani 2 ga ko'paytiramiz.

$$\begin{cases}\dfrac{2}{x}+\dfrac{8}{y}=1\\[2mm]\dfrac{2}{x}+\dfrac{3}{y}=\dfrac{4}{5}\end{cases}$$ tenglamalarni ayiramiz.

$$\dfrac{2}{x}+\dfrac{8}{y}=1$$
$$-$$
$$\dfrac{2}{x}+\dfrac{3}{y}=\dfrac{4}{5}$$

$$\frac{5}{y}=\frac{1}{5},\ y=25.$$

Javob: 25.

18. Muntazam yigirma burchakli piramidaning yon qirrasi 9 ga, piramidaning balandligi 6 ga teng. Piramidaga tashqi chizilgan sferaning radiusini toping.

Berilgan:

$n=20$

$\ell=9$

$H=6$

$R=?$

$SO=H,$

$BO=R,$

$SB=\ell$

Yechish:

$$R^2=\ell^2-H^2=9^2-6^2,\ R=3\sqrt5$$

BO_1 – sfera radiusi.
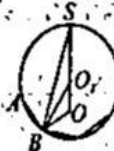
$BO_1=R_1$

ΔBOO_1 – to'g'ri burchakli

$OO_1=6-R_1$

$$R_1^2=(6-R_1)^2+(3\sqrt5)^2$$

$$R_1^2=36-12R_1+R_1^2+45$$

$$R_1=\frac{81}{12}=\frac{27}{4}=6\frac{3}{4}.$$

Javob: $6\dfrac{3}{4}$.

19. $f(x) = 3 - x$ va $f(g(x)) = 3^x + 3$ bo'lsa, $g(3)$ ni toping.

Yechish:
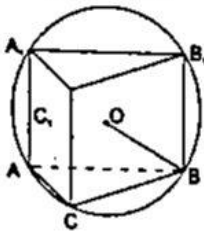
$f(x) = 3 - x$, $f(g(x)) = 3 - g(x)$

$3 - g(x) = 3^x + 3$, $g(x) = -3^x$

$g(3) = -3^3 = -27$.

Javob: -27.

20. Uchburchakli prizma asosining tomonlari 6 sm, 8 sm, 10 sm, balandligi 24 sm. Prizmaga tashqi chizilgan shar radiusini toping.

Yechish:

$ABCDA_1B_1C_1D_1$ uchburchakli prizma

$AB = 10$

$AC = 6$

$BC = 8$

$AA_1 = 24$

1) ABC uchburchak to'g'ri burchakli, chunki $AB^2 = AC^2 + BC^2$

2) ABC uchburchakka tashqi chzilgan aylaning radiusi
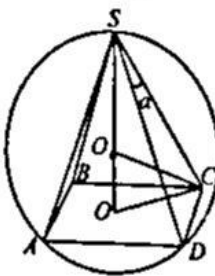
$R_1 = \dfrac{AB}{2} = \dfrac{10}{2} = 5$

3) $OB = R$

$R^2 = \left(\dfrac{BB_1}{2}\right)^2 + R_1^2$, $R^2 = 12^2 + 5^2 = 13^2$

$R = 13$.

Javob: 13.

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

$SABCD$ – muntazam to'rtburchakli piramida.
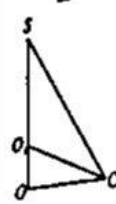
$SO = H$,

$SC = \ell$,

$ABCD$ – kvadrat.

$S_{yon} = 4 \cdot \dfrac{\ell^2 \cdot \sin\alpha}{2}$, $S_{yon} = \dfrac{4a \cdot h_a}{2}$

$\triangle DSC$ teng yonli,

$SE = h_a$ – apofema

$DC = a$

$\cos\dfrac{\alpha}{2} = \dfrac{h_a}{\ell}$, $h_a = \ell \cdot \cos\dfrac{\alpha}{2}$

$\sin\dfrac{\alpha}{2} = \dfrac{a}{2\ell}$, $a = 2\ell \cdot \sin\dfrac{\alpha}{2}$

$OC = \dfrac{a\sqrt{2}}{2}$,

$O_1C = R$

$SO = \sqrt{SC^2 - OC^2} = \sqrt{\ell^2 - \left(\ell\sqrt{2} \cdot \sin\dfrac{\alpha}{2}\right)^2} =$

$= \ell \cdot \sqrt{1 - 2\sin^2\dfrac{\alpha}{2}} = \ell \cdot \sqrt{\cos\alpha}$

$H = \ell\sqrt{\cos\alpha}$

$\triangle O_1OC$ to'g'ri burchakli.

$O_1C^2 = O_1O^2 + OC^2$

$R^2 = (H - R)^2 + \left(\sqrt{2}\ell\sin\dfrac{\alpha}{2}\right)^2$

$H \cdot (2R - H) = 2\ell^2 \sin^2\dfrac{\alpha}{2}$

$2R = \dfrac{2\ell^2 \sin^2\dfrac{\alpha}{2}}{\ell\sqrt{\cos\alpha}} - \ell\sqrt{\cos\alpha}$

$R = \dfrac{\ell}{2}\left(\dfrac{2\sin^2\dfrac{\alpha}{2} + \cos\alpha}{\sqrt{\cos\alpha}}\right) = \dfrac{\ell}{2\sqrt{\cos\alpha}}$

$\ell = 2R\sqrt{\cos\alpha}$

$S_{yon} = 2 \cdot \left(2R\sqrt{\cos\alpha}\right)^2 \cdot \sin\alpha =$

$= 4R^2 \cdot 2\sin\alpha\cos\alpha = 4R^2 \sin2\alpha$.

Javob: $4R^2\sin2\alpha$.

22. a ning qanday qiymatida $y = ax + 6$ to'g'ri chiziq $y = -\dfrac{5}{x}$ funksiyaga urinadi.

Yechish:

$y = ax + 6$, $y = -\dfrac{5}{x}$

1) $ax + 6 = -\dfrac{5}{x}$, $ax^2 + 6x + 5 = 0$

2) $ax^2 + 6x + 5 = 0$ da $D = 0$ bo'lsa, to'g'ri chiziq giperbolaga urinadi.

$D = 6^2 - 4 \cdot a \cdot 5 = 0$.

$9 - 5a = 0$

$5a = 9$, $a = 1,8$.

Javob: 1,8.

23. Radiusi 2 sm ga teng bo'lgan aylanaga yuzasi 20 sm^2 ga teng bo'lgan trapetsiya tashqi chizilgan. Trapetsiyaning yon tomonini toping.

Yechish:

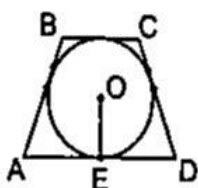ABCD trapetsiya

$AB = CD$

$OE - r = 2$ sm

$S_t = 20$ sm^2

$AB = ?$

$AB = c$, $AD = a$, $BC = b$.

$a + b = 2c$ chunki aylana ichki chizilgan.

$h = 2r = 4$ sm.

$S_t = \dfrac{a+b}{2} \cdot h = \dfrac{2c}{2} \cdot 4 = c \cdot 4$

$4c = 20$, $c = 5$ sm.

Javob: 5 sm.

24. $y = \dfrac{x}{x^2 + 1}$ funksiyaning qiymatlar sohasini toping.

Yechish:

$y = \dfrac{x}{x^2 + 1}$ qiymatlar sohasini topamiz.

1) $y' = \left(\dfrac{x}{x^2+1}\right)' = \dfrac{(x)' \cdot (x^2+1) - x \cdot (x^2+1)'}{(x^2+1)^2} =$

$= \dfrac{x^2 + 1 - 2x^2}{(x^2+1)^2}$

2) $y' = 0$.

$-x^2 + 1 = 0$, $x = \pm 1$

3) $y(1) = \dfrac{1}{1+1} = \dfrac{1}{2}$

$y(-1) = \dfrac{-1}{1+1} = -\dfrac{1}{2}$

4) $E(y) = [-\dfrac{1}{2}; \dfrac{1}{2}]$

Javob: $[-\dfrac{1}{2}; \dfrac{1}{2}]$.

25. Hisoblang: $\left(2 \cdot \dfrac{ctg195° - ctg100°}{ctg195° \cdot ctg100° + 1} + \right.$

$\left. + 2\sin185°\cos185°\right) : \left(\dfrac{\sin5°}{\cos^3 5°}\right)^{-1}$.

Yechish:

$\left(2 \cdot \dfrac{ctg195° - ctg100°}{ctg195° \cdot ctg100° + 1} + \right.$

$\left. + 2\sin185°\cos185°\right) : \left(\dfrac{\sin5°}{\cos^3 5°}\right)^{-1}$

1) $ctg(x - y) = \dfrac{ctgx \cdot ctgy + 1}{ctgx - ctgy} = \left(\dfrac{ctgx - ctgy}{ctgx \cdot ctgy + 1}\right)^{-1}$

$\dfrac{ctg195° - ctg100°}{ctg195° \cdot ctg100° + 1} = \dfrac{1}{ctg(195° - 100°)} =$

$= tg95° = -ctg5°$.

2) $2\sin185° \cdot \cos185° = \sin2 \cdot 185° =$

$= \sin370° = \sin10°$.

3) $2 \cdot (-ctg5°) + \sin10° = \dfrac{-2\cos5°}{\sin5°} +$

$+ 2\sin5°\cos5° = -2\cos5°\left(\dfrac{1}{\sin5°} - \sin5°\right) =$

$= -2\cos5°\left(\dfrac{1 - \sin^2 5°}{\sin5°}\right) =$

$-2\cos5° \cdot \dfrac{\cos^2 5°}{\sin5°} = -\dfrac{2\cos^3 5°}{\sin5°}$

4) $-\dfrac{2\cos^3 5°}{\sin5°} : \left(\dfrac{\sin5°}{\cos^3 5°}\right)^{-1} =$

$= \dfrac{-2\cos^3 5°}{\sin5°} : \dfrac{\cos^3 5°}{\sin5°} = -2$.

Javob: -2.

26. $\begin{cases} x^{\sqrt{y}} = 16 \\ \sqrt{y} - 2\log_2 x = 2 \end{cases}$ bo'lsa, $y - 4x$ qiymatini toping.

Yechish:

$\begin{cases} x^{\sqrt{y}} = 16 \\ \sqrt{y} - 2\log_2 x = 2 \end{cases}$, $y - 4x = ?$

1) aniqlanish sohasi $y \geq 0, x > 0$.

2) $x^{\sqrt{y}} = 16$, $\log_2 x^{\sqrt{y}} = \log_2 16$,

$\sqrt{y} \log_2 x = 4$, $\sqrt{y} = \dfrac{4}{\log_2 x}$

3) $\dfrac{4}{\log_2 x} - 2\log_2 x = 2$, $\dfrac{2}{\log_2 x} - \log_2 x = 1$.

$\log_2 x = a$

$\dfrac{2}{a} - a - 1 = 0$, $2 - a^2 - a = 0$,

$a^2 + a - 2 = 0$.

$a = 1$, $a = -2$.

4) $\log_2 x = 1$, $x = 2$

$\log_2 x = -2$, $x = \dfrac{1}{4}$

5) $\sqrt{y} = \dfrac{4}{\log_2 x}$; $\sqrt{y} = \dfrac{4}{1} = 4$, $y = 16$

$\sqrt{y} = \dfrac{4}{\log_2 x}$; $\dfrac{4}{-2} = -2$,

$\sqrt{y} = -2 \rightarrow \varnothing$

$x = 2$; $y = 16$ tenglamalar sistemasini ganoatlantiradi.

6) $(2; 16)$, $y - 4x = 16 - 4 \cdot 2 = 8$.

Javob: 8.

27. $\dfrac{\sqrt[4]{48} \cdot \sqrt{245}}{\sqrt{5} \cdot \sqrt[4]{3}}$ ifodaning qiymatini toping.

Yechish:
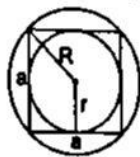
$\dfrac{\sqrt[4]{48} \cdot \sqrt{245}}{\sqrt{5} \cdot \sqrt[4]{3}}$ ildiz xossasiga ko'ra

$\sqrt[4]{\dfrac{48}{3}} \cdot \sqrt{\dfrac{245}{5}} = \sqrt[4]{16} \cdot \sqrt{49} = \sqrt[4]{2^4} \cdot \sqrt{7^2} = 2 \cdot 7 = 14$.

Javob: 14.

28. Silindrgá ichki va tashqi chízilgan sharlarning diametrlari nisbatini toping.

Yechish:

Silindrga ichki va tashqi shar chizish uchun $H = 2r$ bolishi kerak. $H = 2r = a$, r – silindr radiusi. H – silindr balandligi

$r = \dfrac{a}{2}$, $d = 2r = a$, $R = \dfrac{a\sqrt{2}}{2}$,

$D = 2R = a\sqrt{2}$

$\dfrac{d}{D} = \dfrac{a}{a\sqrt{2}} = \dfrac{1}{\sqrt{2}} = \dfrac{\sqrt{2}}{2}$.

Javob: $\dfrac{\sqrt{2}}{2}$.

29. $(x) = \dfrac{10\ln 5}{\pi} \text{tg}(\pi \cdot \log_5(x^2 - 4))$

funksiyaning $x_0 = 3$ nuqtadagi hosilasini toping.

Yechish:

$f(x) = \dfrac{10\ln 5}{\pi} \text{tg}(\pi \cdot \log_5(x^2 - 4))$

$f'(3) = ?$

$f'(x) = \dfrac{10\ln 5}{\pi} (\text{tg}(\pi \cdot \log_5(x^2 - 4)))' =$

$= \dfrac{10\ln 5}{\pi} \cdot \dfrac{\dfrac{2x\pi}{(x^2 - 4)\ln 5}}{\cos^2(\pi \cdot \log_5(x^2 - 4))}$

$f'(3) = \dfrac{10\ln 5}{\pi} \cdot$

$\dfrac{2 \cdot 3 \cdot \pi}{(3^2 - 4)\ln 5 \cdot \cos^2(\pi \log_5(9 - 4))} =$

$= \dfrac{10\ln 5}{\pi} \cdot \dfrac{6\pi}{5 \cdot \ln 5 \cdot \cos^2 \pi} = 12$

Javob: 12.

30. $y = -3x^2 + 8x - 9$ va $y = x^2 + 8x + 13$ funksiyalar grafiklaridagi eng yaqin nuqta orasidagi masofani toping.

Yechish:

$y = -3x^2 + 8x - 9$, $y = x^2 + 8x + 13$ funksiyalar grafikalarini yasaymiz.
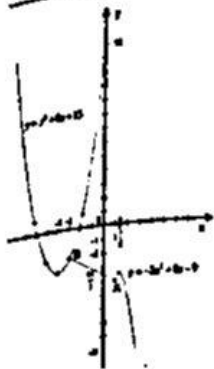
1) $y = -3x^2 + 8x - 9$,

$x_0 = \dfrac{4}{3}$, $y_0 = \dfrac{-11}{3}$;

$(0; -9)$

2) $y = x^2 + 8x + 13 = (x + 4)^2 - 3$,

$x_0 = -4$, $y_0 = -3$; $(0; 13)$

34.

$y = -3x^2 + 8x - 9$ va
$y = x^2 + 8x + 13$ funksiyalar grafiklaridagi eng yaqin nuqtalar
$A(1; -4)$ va $B(-3; -2)$
$AB = \sqrt{(1-(-3))^2 + (-4-(-2))^2} =$
$= \sqrt{16+4} = \sqrt{20} = 2\sqrt{5}$.

Javob: $AB = 2\sqrt{5}$.

31. Elektron jadvalda B4:E12 kataklar bloki nechta katakni o'z ichiga oladi?
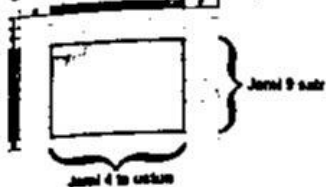
Yechish:

B4:E12.
MS Excel dasturida ko'rsatilgan diapazondagi yacheykalar sonini toppish uchun diapazondagi satrlar sonini undagi ustunlar soniga ko'paytirish darkor.
Satrlar soni: 12-4+1=9 ta.
Ustunlar soni: B, C, D, E – 4ta.
9·4 = 36 ta yacheyka B4:E12 diapazonda.

Javob: 36.

32. HTML-hujjatda bgcolor=FFFFFF atributining vazifasini aniqlang:

Yechish:

HTML-hujjatida fon rangini ikki xil usulda berish mumkin:
1) bgcolor="RED" (rangning nomidan foydalanilgan);
2) bgcolor="#FF0000" (rangning o'n oltilik turidan foydalanilgan).
FFFFFF oq rangni bildiradi.

Javob: oq fonni aniqlaydi.

33. Ali sakkizlik sanoq sistemasida (55; 100) oraliqdagi barcha butun sonlarni yozib chiqdi. Vali esa shu sonlardan avval 5 raqami, so'ng 6 raqami qatnashgan barcha sonlarni o'chirib tashladi. Qolgan sonlar yig'indisini sakkizlik sanoq sistemasida aniqlang.

Yechish:
Ali yozgan sonlar: 56, 57, 60, 61, 62, 63, 64, 65, 66, 67, 70, 71, 72, 73, 74, 75, 76, 77.
Vali shu sonlardan 5 va 6 raqami qatnashgan barcha sonlarni o'chirganidan keyin 70, 71, 72, 73, 74, 77, 100 sonlar qoladi. Ularning sakkizlik sanoq sistemasidagi yig'indisini ketma-ket hisoblaymiz:

$$\begin{array}{c} 70 \\ +71 \\ \hline 161 \end{array} \quad \begin{array}{c} 161 \\ +72 \\ \hline 253 \end{array} \quad \begin{array}{c} 253 \\ +73 \\ \hline 346 \end{array} \quad \begin{array}{c} 346 \\ +74 \\ \hline 442 \end{array} \quad \begin{array}{c} 442 \\ +77 \\ \hline 541 \end{array}$$

Demak, $70_8 + 71_8 + 72_8 + 73_8 + 74_8 + 77_8 = 541_8$ ekan.

Javob: 541.

34. CELLSPACING tegining vazifasi:

Yechish:

CELLSPACINC tegi td yoki th yacheykalar orasidagi masofani belgilaydi. Parametr quyidagicha yoziladi: CELLSPACING=num,

Bu yerda num – yozilishi shart bo'lmagan, piksellarda berilgan parameter qiymati. num kattaligi qo'shni yacheykalar (aniqrog'i ularning chegarasi) orasidagi masofani gorizontal va vertikal bo'yicha belgilaydi. Yozilmaganda num=2 deb olinadi.

Javob: jadval yacheykalari orasidagi masofani belgilaydi.

35. Paskal tilidagi dastur natijasini aniqlang.

```
Var a, b, c: integer; k:boolean;
Begin Randomize; a:=1+Random(1);
b:=1+Trunc(Random); k:=true;
While k Do begin c:=a+b; a:=c mod a+1;
b:=c div b;
If a=b Then k:=false; end;
Write(a+b+c,k); Readln; End.
```

Yechish:

Dasturda a, b, c – butun va k – mantiqiy o'zgaruvchilar qatnashyapti.

Randomize – tasodifiy sonlar generatori.

a:=1+Random(1) = 1; {Random(1) funksiyasi [0; 1) oraliqdan, ya'ni 0 qiymatni qabul qiladi Random(1) = 0}

b:=1+Trunc(Random) = 1; {Argumentsiz random funksiyasi (0, 1) intervaldan ixtiyoriy ratsional son qiymatini qabul qilishi mumkin. Trunc funksiyasi ratsional sonning butun qismini ajratib beradi. Trunc(Random) = 0 bo'ladi.}

k:=true; {k=rost}

Toki k=rost bo'lsa bajar:

begin c:=a+b; a:=c ni a+1 ga bo'lgandagi qoldiq;

b:=c ni b ga bo'lganda butun qismi;

end;

Agar a=b bo'lsa, u holda k:=yolg'on;}

Chop et (a+b+c, k)

Qadam	C	a	b	k
0.	–	1	1	True
1.	2	1	2	True
2.	3	1	1	False

a+b+c = 3+1+1 = 5, k = false.

Javob: 5FALSE

36. Informatika o'rganadigan asosiy predmetni aniqlang.

Yechish:

Informatika fani axborot, uning xususiyatlari, o'lchov birliklari, axborotni qabul qilish, uzatish va qayta ishlash usullarini o'rganadi. Demak informatika fanining asosiy predmeti axborotdir.

Javob: axborot.