5-variant 2017 yil spectrum
@axborotnoma
@axborotnoma_bot

5-variant

1. Birinchi ishchi bir detalni tayyorlash uchun ikkinchisidan 3 daqiqa kam vaqt sarflaydi. Agar 7 soat ichida birinchi ishchi ikkinchisidan 16 ta ko'p detal yasay olsa, ularning har biri shu vaqt ichida qanchadan detal yasay oladi?

Yechish:

7 soatda birinchi ishchi x ta detal yasasa, ikkinchi x – 16 ta detal yasaydi.

Birinchi ishchi ikkinchisidan 3 daqiqa kam vaqt sarflaydi. 3 daqiqa $= \frac{1}{20}$ *soat.*

Tenglama tuzamiz:

$$\frac{7}{x-16} - \frac{7}{x} = \frac{1}{20}$$

$140(x - x + 16) = x(x - 16)$

$x^2 - 16x - 140 \cdot 16 = 0$

$x^2 - 16x - 2240 = 0,$

$x = 56,$

$x = -40$

Birinchi ishchi 56 ta, ikkinchi ishchi 56 – 16 = 40 ta detal yasay oladi.

Javob: 56; 40.

2. Qarang: 2-variant 19-savol (15-bet).

3. $\cos(\alpha - \beta)\cdot(\operatorname{tg}\alpha\cdot\operatorname{tg}\beta - 1) + (1 + \operatorname{tg}\alpha\cdot\operatorname{tg}\beta)\cdot\cos(\alpha + \beta)$ ifodani soddalashtiring.

Yechish:

$$\cos(\alpha-\beta)\cdot(\operatorname{tg}\alpha\cdot\operatorname{tg}\beta - 1) + (1 + \operatorname{tg}\alpha\operatorname{tg}\beta)\cdot\cos(\alpha+\beta) =$$

$$= \cos(\alpha-\beta)\left(\frac{\sin\alpha\cdot\sin\beta}{\cos\alpha\cdot\cos\beta} - 1\right) +$$

$$+\left(1 + \frac{\sin\alpha\cdot\sin\beta}{\cos\alpha\cdot\cos\beta}\right)\cdot\cos(\alpha+\beta) =$$

$$= \cos(\alpha-\beta)\cdot\frac{\sin\alpha\cdot\sin\beta - \cos\alpha\cdot\cos\beta}{\cos\alpha\cdot\cos\beta} +$$

$$+\frac{\cos\alpha\cdot\cos\beta + \sin\alpha\cdot\sin\beta}{\cos\alpha\cdot\cos\beta}\cdot\cos(\alpha+\beta) =$$

$$= \frac{-\cos(\alpha-\beta)\cdot\cos(\alpha+\beta)}{\cos\alpha\cdot\cos\beta} +$$

$$+\frac{\cos(\alpha-\beta)\cdot\cos(\alpha+\beta)}{\cos\alpha\cdot\cos\beta} = 0.$$

Javob: 0.

4. Tenglamani yeching: $x^2 - 10x\cdot\lg x = 0$.

Yechish:

$x^2 - 10x\cdot\lg x = 0$

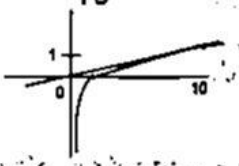
1) aniqlanish sohasi $x > 0$

2) $x(x - 10\lg x) = 0$

$x = 0$ *yechim emas.*

$x - 10\cdot\lg x = 0.$

$\lg x = \frac{x}{10}$



3) $\lg x = \frac{x}{10}$ *tenglamani grafik usulida yechamiz. Funksiya grafiklari bitta nuqtada kesishadi.* $x = 10$ *tenglama yechimi.*

Javob: 10.

5. Quyidagi tenglamani yeching:

$0,3(2x - 1) - 0,4(x + 8) = 1,2x - 1.$

Yechish:

$0,3(2x - 1) - 0,4(x + 8) = 1,2x - 1.$

$0,6x - 0,3 - 0,4x - 3,2 = 1,2x - 1$

$0,2x - 3,5 = 1,2x - 1$

$x = -2,5.$

Javob: –2,5.

6. SABCD – piramidada ABCD – kvadrat. K nuqta SD kesma o'rtasi. AB = SD = 2 sm bo'lsa, BK kesma uzunligini toping.

Yechish:

SABCD piramida

$AB = CD = AD = BC = 2$

$SK = KD = 1$

$DB = \sqrt{AB^2 + AD^2} =$

$= \sqrt{2^2 + 2^2} = 2\sqrt{2}$

$DE = \frac{2\sqrt{2}}{4} = \frac{\sqrt{2}}{2} = EO$

ΔKED to'g'ri burchakli $KD^2 = DE^2 + KE^2$

$$KE^2 = 1^2 - \left(\frac{\sqrt{2}}{2}\right)^2 = \frac{1}{2}$$

$$KE = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

ΔKEB to'g'ri burchakli

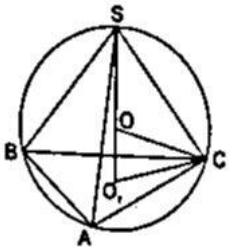
$$KB^2 = \left(\frac{\sqrt{2}}{2}\right)^2 + \left(\frac{3\sqrt{2}}{2}\right)^2 = \frac{1}{2} + \frac{9}{2} = 5$$

$KB = \sqrt{5}$.

Javob: $\sqrt{5}$.

7. Qirrasi a ga teng bo'lgan muntazam tetraedrga tashqi chizilgan shar radiusini toping.

Yechish:



SABC tetraedr
$AB = a$
$SO_1 = H$
$OC = R$ *shar radiusi*
$O_1C = R_1$ – *ABC uchburchakka tashqi chizilgan aylana radiusi*.

$$O_1C = \frac{a}{\sqrt{3}}$$

$$SO_1 = \sqrt{SC^2 - O_1C^2} = \sqrt{a^2 - \frac{a^2}{3}} = a\sqrt{\frac{2}{3}}$$

ΔOO_1C to'g'ri burchakli

$$OO_1 = H - R = a\sqrt{\frac{2}{3}} - R$$

$$O_1C = \frac{a}{\sqrt{3}}$$

$$OC^2 = OO_1^2 + O_1C^2,$$

$$R^2 = \left(a\sqrt{\frac{2}{3}} - R\right)^2 + \left(\frac{a}{\sqrt{3}}\right)^2$$

$$\left(R - \frac{a\sqrt{2}}{\sqrt{3}} + R\right)\left(R + \frac{a\sqrt{2}}{\sqrt{3}} - R\right) = \frac{a^2}{3}$$

$$\left(2R - \frac{a\sqrt{2}}{\sqrt{3}}\right)\frac{a\sqrt{2}}{\sqrt{3}} = \frac{a^2}{3}$$

$$2\sqrt{3}R = \frac{a}{\sqrt{2}} + a\sqrt{2},$$

$$R = \frac{3a}{2\sqrt{2}\cdot\sqrt{3}} = \frac{a\sqrt{3}}{2\sqrt{2}} = \frac{a\sqrt{6}}{4}.$$

Javob: $\frac{a\sqrt{6}}{4}$.

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

Yechish:

a_1, a_2, a_3, a_4, a_5 – *tub sonlar.*
$d = a_2 - a_1 = a_3 - a_2 = a_4 - a_3 = a_5 - a_4 = 6$
Bu sonlar 5, 11, 17, 23, 29.
1) $a_1 + a_3 - a_2 = 5 + 6 = 11$
2) $a_1 + a_3 - a_2 = 2a_2 - a_2 = a_2 = 11$.

Javob: 11.

9. $y = -\frac{\ln x}{x} + e^{-1}$ funksiyaning $[\sqrt{e}; e^2]$ oraliqdagi eng kichik qiymatini toping.

Yechish:

$$y = -\frac{\ln x}{x} + e^{-1}, [\sqrt{e}; e^2]$$

$y_{min} = ?$
1) *aniqlanish sohasi* $x > 0$.

$$2)\ y(\sqrt{e}) = -\frac{\ln\sqrt{e}}{\sqrt{e}} + \frac{1}{e} =$$

$$= -\frac{1}{2\sqrt{e}} + \frac{1}{e} = \frac{-\sqrt{e} + 2}{2e}$$

$$y(e^2) = -\frac{\ln e^2}{e^2} + \frac{1}{e} = -\frac{2}{e^2} + \frac{1}{e} = \frac{-2 + e}{e^2}$$

$$3)\ y' = \left(-\frac{\ln x}{x} + \frac{1}{e}\right)' = \frac{-(\ln x)' \cdot x + \ln x \cdot (x)'}{x^2} =$$

$$= \frac{-\frac{1}{x}\cdot x + \ln x}{x^2} = \frac{-1 + \ln x}{x^2}$$

4) $y' = 0$, $\ln x = 1$,
$x = e$
$e \in [\sqrt{e}; e^2]$

5) $y(e) = -\frac{\ln e}{e} + \frac{1}{e} = -\frac{1}{e} + \frac{1}{e} = 0$

6) $y_{min} = y(e) = 0.$

Javob: 0.

10. $\bar{a} + k\bar{b}$ vektor k ning qanday qiymatida $\bar{c}$ vektorga perpendikulyar bo'ladi?
$\bar{a}(-4; 3)$, $\bar{b}(2; 5)$, $\bar{c}(-6; 5)$.

Yechish:

1) $(\bar{a} + k\bar{b}) \perp c$, $(\bar{a} + k\bar{b}) \cdot \bar{c} = 0$

2) $\overline{ac} + k\overline{bc} = 0$, $\overline{ac} = 39$, $\overline{bc} = 13$
$39 + k \cdot 13 = 0$, $k = -3$.

Javob: –3.

11. Ildizidan biri $x_1 = 2 - \sqrt{3}$ bo'lgan ratsional koeffitsiyentli kvadrat tenglamani belgilang.

Yechish:
Viyet teoremasiga ko'ra:

$$\begin{cases} x_1 + x_2 = -p \\ x_1 \cdot x_2 = q \end{cases}$$

$x^2 + px + q = 0$
$x_1 = 2 - \sqrt{3}$ *bo'lsa,* $x_2 = 2 + \sqrt{3}$ *bo'ladi.*
$-p = 2 - \sqrt{3} + 2 + \sqrt{3} = 4$, $p = -4$
$q = (2 - \sqrt{3})(2 + \sqrt{3}) = 1$, $q = 1$
$x^2 - 4x + 1 = 0.$

Javob: $x^2 - 4x + 1 = 0$.

12. Agar $f(x) = x^{\sin 6x}$ bo'lsa, $f'\left(\frac{\pi}{12}\right)$ ni toping.

Yechish:
$y = x^{\sin 6x}$ *tenglikning ikkala qismini logarifmlaymiz.*
$\ln y = \ln x^{\sin 6x}$, $\ln y = \sin 6x \cdot \ln x$
$(\ln y)' = (\sin 6x \cdot \ln x)'$

$$\frac{y'}{y} = 6\cos 6x \cdot \ln x + \sin 6x \cdot \frac{1}{x}$$

$$y' = y \cdot \left(6\cos 6x \cdot \ln x + \frac{\sin 6x}{x}\right)$$

$$y' = x^{\sin 6x}\left(6 \cdot \cos 6x \cdot \ln x + \frac{six6x}{x}\right)$$

$$y' = \left(\frac{\pi}{2}\right)^{\sin 6 \cdot \frac{\pi}{12}}\left(6\cos 6 \cdot \frac{\pi}{12} \cdot \ln\frac{\pi}{12} + \frac{\sin 6 \cdot \frac{\pi}{12}}{\frac{\pi}{12}}\right) =$$

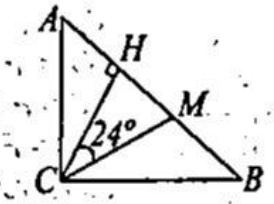
$$= \left(\frac{\pi}{12}\right)^{\sin\frac{\pi}{2}} \cdot \left(6\cos\frac{\pi}{2} \cdot \ln\frac{\pi}{12} + \frac{12}{\pi}\sin\frac{\pi}{2}\right) =$$

$$= \frac{\pi}{12} \cdot \frac{12}{\pi} = 1.$$

Javob: 1.

13. To'g'ri burchakli uchburchakning gipotenuzasiga tushirilgan mediana va balandlik orasidagi burchak 24° ga teng. Shu balandlik va katta katet orasidagi burchakni toping.

Berilgan:
ΔABC, $\angle C = 90°$
CH – *balandlik*
CM – *mediana*
$\angle HCM = 24°$
BC – *katta katet*
$\angle HCB - ?$



Yechish:

$CM = \frac{1}{2}AB = MB \Rightarrow \Delta CMB$ *da* $CM = MB$
Demak, $\angle MCB = \angle MBC$
ΔCHM *da:*
$\angle HMC = 90° - 24° = 66°$
$\angle CMB = 180° - 66° = 114°$
$\angle MCB + \angle MBC + \angle CMB = 180°$
(ΔCMB *dan)*

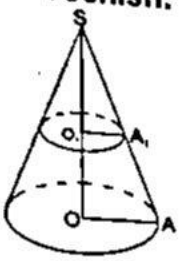
$$\Rightarrow \angle MCB = \frac{180° - 114°}{2} = 33°$$

$$\Rightarrow \angle HCB = \angle HCH + \angle MCB = 24° + 33° = 57°$$

Javob: 57°.

14. Konusda asosga parallel bo'lgan kesim o'tkazilgan. Asos radiusi 4 ga teng, kesim yuzasi 4π ga teng. Konus hajmi 80 ga teng bo'lsa, hosil bo'lgan kesik konusning hajmini toping.

Yechish:



$R = OA = 4$
$r = O_1A_1$
$SO = H$
$S_{kesim} = 4\pi$
$V_k = 80$
$V_{k.k} = ?$

$S_{kesim} = \pi r^2$, $\pi r^2 = 4\pi$, $r^2 = 4$, $r = 2$.

$V_k = \frac{1}{3}\pi R^2 H$

$\frac{1}{3}\pi \cdot 4^2 \cdot H = 80$, $\pi H = 15$, $H = \frac{15}{\pi}$

$V_{k.k} = \frac{1}{3}\pi h(r^2 + rR + R^2)$, $h = O_1O$

ΔSO_1A_1 va ΔSOA o'xshash.

$\frac{H}{H-h} = \frac{R}{r} = \frac{4}{2} = 2$

$H = 2H - 2h$

$H = 2h$

$h = \frac{H}{2} = \frac{15}{2\pi}$

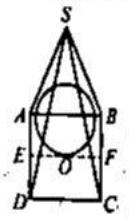
$V_{k.k} = \frac{1}{3}\pi \cdot \frac{15}{2\pi} \cdot (2^2 + 2 \cdot 4 + 4^2) = 5 \cdot 14 = 70.$

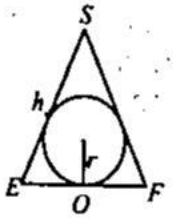
Javob: 70.

15. Balandligi 9 ga, yon yoqi va asos tekisligi orasidagi burchagi 60° ga teng bo'lgan muntazam piramidaga ichki chizilgan shaming hajmini toping.

Berilgan:
S_{ABCD} – *muntazam to'rtburchakli piramida*
$SO = H = 9$
$\angle SEO = 60°$
$V_{shar} = ?$

Yechish:





$V_{shar} = \frac{4}{3}\pi r^3$

$\angle SEO = \angle SFO = 60°$ *bo'lganligi sababli,* ΔSEF *teng tomonli.*

$r = \frac{a\sqrt{3}}{6}$

$SE = a$, $SO = H$

$H^2 = a^2 - \frac{a^2}{4} = \frac{3a^2}{4}$, $H = \frac{a\sqrt{3}}{2} = 9$

$a = \frac{18}{\sqrt{3}} = 6\sqrt{3}$

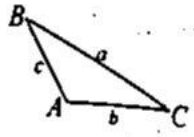
$r = \frac{6\sqrt{3} \cdot \sqrt{3}}{6} = 3$

$V_{shar} = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \cdot 3^3 = 36\pi.$

Javob: 36π.

16. ABC uchburchakda $|AB| = 2$, $|BC| = 11$, $\angle A > 90°$ bo'lsa, $|AC|$ ning qiymatini toping.

Yechish:



Uchburchak tengsizligidan foydalanib yechamiz.
$c = 2$, $a = 11$,
$b = ?$

$$1)\ \begin{cases} a+b>c \\ b+c>a \\ a+c>b \end{cases} \Rightarrow \begin{cases} 11+b>2 \\ b+2>11 \\ 11+2>b \end{cases} \Rightarrow \begin{cases} b>-9 \\ b>9 \\ b<13 \end{cases}$$

2) Ikkinchi tomondan: o'tmas burchakli uchburchakda

$a^2 > b^2 + c^2 \Rightarrow b^2 < a^2 - c^2 \Rightarrow b^2 < 121 - 4 \Rightarrow$

$b^2 < 117 \Rightarrow b < \sqrt{117} \approx 10{,}8$

$9 < b < 13.$

Javob: $9 < |AC| < 11$

17. $y = |x| + |x-1| + |x-2|$ funksiya x ning qanday qiymatida eng kichik qiymatga erishadi?

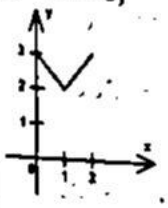
Yechish:

$y = |x| + |x-1| + |x-2|$ *grafik usulida yechamiz.*

$x = 0$ $x = 0$ da $y(0) = 3$

$x - 1 = 0$, $x = 1$ da $y(1) = 2$

$x - 2 = 0$, $x = 2$ da $y(2) = 3$

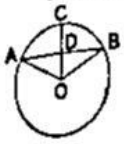


Funksiyaning eng kichik qiymati $x = 1$ *da* $y(1) = 2$.

Javob: $x = 1$.

18. Segmentni hosil qilgan vatar uzunligi 10 sm, uning balandligi esa 4 ga teng. Shu segmentga mos bo'lgan markaziy burchakni toping.

Yechish:



$AB = 10$
$CD = 4$
$\angle AOB = ?$

1) $AO = CO = OB = R$
$OD = x$, $CO = x + 4$
$AD = DB = 5$
2) $OD^2 = OB^2 - BD^2$, $x^2 = (x+4)^2 - 5^2$.
$x^2 + 8x + 16 - 25 = x^2$

$8x = 9$, $x = \frac{9}{8}$, $x + 4 = \frac{41}{8}$.

3) ΔODB to'g'ri burchakli, $\angle DOB = \alpha$.

$\sin\alpha = \frac{BD}{OB} = \frac{5 \cdot 8}{41} = \frac{40}{41}$,

$\alpha = \arcsin\frac{40}{41}$, $\cos\alpha = \frac{9}{41}$.

4) $\angle AOB = 2\alpha = 2 \cdot \arcsin\frac{40}{41}$.

Javob: $2 \cdot \arcsin\frac{40}{41}$.

19. Agar $f(x) = \frac{x^2}{\sqrt{1+x^2}}$ bo'lsa, $f(\text{ctg}x)$ ni toping.

Yechish:

$$f(ctgx) = \frac{ctg^2x}{\sqrt{1+ctg^2x}} = \frac{\cos^2 x}{\sin^2 x} \cdot \frac{\sin x}{\sqrt{\sin^2 x + \cos^2 x}} = \frac{\cos^2 x}{\sin x} = \cos x \cdot ctgx$$

Demak, $f(ctgx) = \cos x \cdot ctgx$.

Javob: $f(\text{ctg}x) = \cos x \cdot \text{ctg}x$.

20. Cheksiz kamayuvchi geometrik progressiyaning maxraji $\frac{1}{6}\sqrt{30}$ ga, hadlari yig'indisi esa $\frac{6(\sqrt{30}+5)}{5}$ ga teng. Ushbu progressiyaning uchinchi hadini toping.

Yechish:

$q = \frac{\sqrt{30}}{6}$, $S = \frac{6(\sqrt{30}+5)}{5}$,
$b_3 = ?$

$q < 1$ bo'lganligi sababli $S = \frac{b_1}{1-q}$

$$\frac{6(\sqrt{30}+5)}{5} = \frac{b_1}{1-\frac{\sqrt{30}}{6}},$$

$$b_1 = \frac{6(\sqrt{30}+5)}{5} \cdot \frac{6-\sqrt{30}}{6} = \frac{\sqrt{30}}{5}$$

$$b_3 = b_1 \cdot q^2 = \frac{\sqrt{30}}{5} \cdot \left(\frac{\sqrt{30}}{6}\right)^2 = \frac{\sqrt{30}}{5} \cdot \frac{30}{36} = \frac{\sqrt{30}}{6}$$

Javob: $\frac{\sqrt{30}}{6}$.

21. $\alpha = 30°$, $a = (\text{tg}\alpha)^{\text{tg}\alpha}$, $b = (\text{ctg}\alpha)^{\text{ctg}\alpha}$, $c = (\text{ctg}\alpha)^{\text{tg}\alpha}$ bo'lsa, quyidagilardan qaysi biri o'rinli?

Yechish:

1) $tg30° = \frac{1}{\sqrt{3}}$, $ctg30° = \sqrt{3}$

2) $a = \left(\frac{1}{\sqrt{3}}\right)^{\frac{1}{\sqrt{3}}} = \left(\sqrt{3}\right)^{-\frac{1}{\sqrt{3}}}$

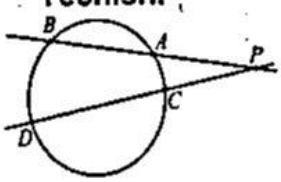
$b = \left(\sqrt{3}\right)^{\sqrt{3}}$, $c = \left(\sqrt{3}\right)^{\frac{1}{\sqrt{3}}}$

$\sqrt{3} > 1$ bo'lganligi sababli $a < c < b$ yoki $b > c > a$.

Javob: $b > c > a$.

22. Aylanadan tashqaridagi nuqtadan aylanaga ikkita kesuvchi o'tkazilgan. Birinchi kesuvchining ichki kesmasi 47 m ga teng, tashqisi esa 9 ga teng; ikkinchi kesuvchining ichki kesmasi tashqi kesmadan 72 m katta. Ikkinchi kesuvchining uzunligini toping.

Yechish:



$AB = 47\ m$
$PA = 9m$
$PC = x$
$CD = x + 72\ m$
$PD = ?$

Kesuvchining xossasiga ko'ra
$PA \cdot PB = PC \cdot PD$
$9 \cdot 56 = x(2x + 72)$
$x(x + 36) = 9 \cdot 28$
$x^2 + 36x - 252 = 0$

$$x_{1,2} = \frac{-36 \pm \sqrt{36^2 + 4 \cdot 252}}{2} = \frac{-36 \pm 48}{2} =$$

$= -18 \pm 24.$
$x = 6$
$PD = 2x + 72 = 2 \cdot 6 + 72 = 84$ m.

Javob: 84 m.

23. k ning qanday qiymatida $2x - 6y + 3 = 0$ va $x - ky - 1 = 0$ to'g'ri chiziqlar perpendikulyar bo'ladi?

Yechish:
$2x - 6y + 3 = 0$ va $x - ky - 1 = 0$
Ikkita to'g'ri chiziq perpendikulyar bolishi uchun $y = K_1x + b_1$, $y = K_2x + b_2$
$K_1 \cdot K_2 = -1$ bo'lishi kerak.

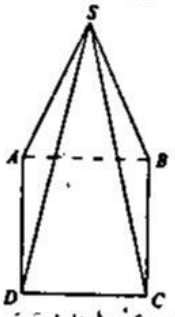
$$y = \frac{2x+3}{6} = \frac{x}{3} + \frac{1}{2} \text{ va } y = \frac{x-1}{k} = \frac{x}{k} - 1.$$

$$K_1 = \frac{1}{3},\ K_2 = \frac{1}{k},\ \frac{1}{3} \cdot \frac{1}{k} = -1,\ k = -\frac{1}{3}.$$

Javob: $-\frac{1}{3}$.

24. Muntazam to'rtburchakli piramidaning asosi yuzi 100 sm^2, yon sirti 260 sm^2 bo'lsa, hajmini toping.

Yechish:



SABCD muntazam to'rtburchakli piramida.
$S_{asos} = 100$, $AB = a$,
$a^2 = 100$, $a = 10$.

$$S_{yon} = \frac{P \cdot h_a}{2},$$

h_a – apofema.

$P = 4a$, $a = 10$

$$260 = \frac{4a \cdot h_a}{2}$$

$130 = a \cdot h_a$, $h_a = 13$

$$V = \frac{a^2 \cdot H}{3}$$

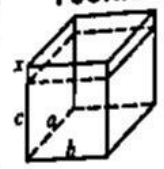
$$H = \sqrt{h_a^2 - \left(\frac{a}{2}\right)^2} = \sqrt{13^2 - 5^2} = 12$$

$$V = \frac{100 \cdot 12}{3} = 400.$$

Javob: 400.

25. Akvariumning bo'yi 150 sm eni 110 sm balandligi 80 sm. Suv sathi yuqoridan 10 sm pastda bo'lishi uchun akvariumga necha litr suv quyish kerak?

Yechish:



$a = 110$ sm
$b = 150$ sm
$c = 80$ sm
$x = 10$ sm

$V = a \cdot b \cdot (c - x) = 110 \cdot 150 \cdot (80 - 10) =$
$= 11 \cdot 15 \cdot 7 \cdot 10^3 = 1155 \cdot 10^3$ sm $= 1155$ l.

Javob: 1155.

26. **Qarang: 2-variant 27-savol (17-bet).**

27. Agar $x = -1$ bo'lsa, $a^2 \frac{(x-b)(x-c)}{(a-b)(a-c)} +$
$+ b^2 \frac{(x-a)(x-c)}{(b-a)(b-c)} + c^2 \frac{(x-a)(x-b)}{(c-a)(c-b)}$ ning qiymatini toping. (Bu yerda $(a - b)(a - c)(b - c) \neq 0$).

Yechish:
$(a - b)(a - c)(b - c) \neq 0 \Rightarrow a \neq b \neq c$
$a \neq b \neq c$ bo'lganligi uchun $a = 0$, $b = 1$, $c = 2$ tanlash yo'li bilan yechamiz.

$$0 \cdot \frac{(-1-1)(-1-2)}{(0-1)(0-2)} + 1 \cdot \frac{(-1-0)(-1-2)}{(1-0)(1-2)} +$$

$$+ 2^2 \cdot \frac{(-1-0)(-1-1)}{(2-0)(2-1)} = \frac{-1 \cdot (-3)}{1 \cdot (-1)} + 4 \cdot \frac{-1 \cdot (-2)}{2 \cdot 1} =$$

$= -3 + 4 = 1.$

Javob: 1.

28. Agar $f(x) = 2^x \cdot 2x$ bo'lsa, $f'(x) = 0$ tenglamani yeching.

Yechish:
1) $f'(x) = (2^x \cdot 2x)' = 2^x \ln 2 \cdot 2x + 2^x \cdot 2 =$
$= 2 \cdot 2^x \cdot (x \cdot \ln 2 + 1) = 2^{x+1}(x \cdot \ln 2 + 1)$

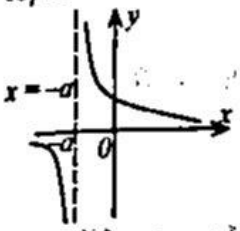
2) $f'(x) = 0$
$2^{x+1} \cdot (x\ln 2 + 1) = 0$
$2^{x+1} \neq 0,\ x\ln 2 + 1 = 0,\ x\ln 2 = -1$
$x = -\frac{1}{\ln 2},\ x = -\log_2 e.$

Javob: $-\log_2 e$.

29. Agar $a > 0$ bo'lsa, $y = \frac{a}{|x+a|}$ funksiyaning gorizontal asimptotasini toping.

Yechish:

$a > 0,\ y = \frac{a}{|x+a|}$ *gorizontal asimptotasini topamiz.*



$x + a = 0,$
$x = -a$ – *vertikal asimptota,*
$y = 0$ – *gorizontal asimptota.*

Javob: $y = 0$.

30. $(x^2 + x - 2)^2 + (x^2 + x - 2) - 2 = x$ tenglamaning butun ildizlari ko'paytmasini toping.

Yechish:
$(x^2 + x - 2)^2 + (x^2 + x - 2) - 2 = x$ *tenglamani yechamiz.*
$(x^2 + x - 2)^2 + x^2 + x - 2 - 2 - x = 0$
$(x^2 + x - 2)^2 + x^2 - 4 = 0$
$x^4 + 2x^2(x - 2) + x^2 - 4x + 4 + x^2 - 4 = 0$
$x^4 + 2x^3 - 4x^2 + 2x^2 - 4x = 0$
$x^4 + 2x^3 - 2x^2 - 4x = 0$
$x(x^3 + 2x^2 - 2x - 4) = 0$
Tenglamaning bitta ildizi $x = 0$ bo'lganligi uchun ildizlari ko'paytmasi 0 ga teng bo'ladi.

Javob: 0.

31. Quyidagi HTML-hujjat kodi yozilishi bo'yicha kataklar ketma-ket sanalganda nechanchi katakda tag chiziq shrift qo'llangan?
<table> <tr> <td colspan=2> test </td>
<td rowspan=2> test </td> </tr> <tr>
<td> test </td> <td> <u> test </u> </td> </tr> </table>.

Yechish:
<u> – tagiga chizilgan shrift
<td> va </td> – bu teglar juftligi jadvalning har bir yacheykasi uchun matn ajratadi;
<table>
1-katak: <tr><td colspan=2> test </td>
2-katak: <td rowspan=2> test</td></tr>
3-katak: <tr><td>test </td>
4-katak: <td><u>test</u></td></tr></table>

Javob: to'rtinchi katakda.

32. Protokol – bu:

Yechish:
Tarmoqda ma'lumotni uzatish qonun-qoidalar va kelishuvlar majmuasi protokol deyiladi. Bunday qonun-qoidalar tarmoq qurilmalari o'zaro ayirboshlaydigan xabarlarning mazmunini, formatini, vaqt parametrlarini, ketma-ketligini va xabardagi xatolarni tekshirish jarayonlarini aniqlab beradi.

Javob: kompyuterlar orasida aloqa o'rnatilishida, ma'lumotlarni qabul qilish va uzatishda foydalanadigan kelishuvlar to'plamidir.

33. HTML tilidagi xujjatda <PRE>...</PRE> teglarining vazifasi:

Yechish:
HTML tilida probellarni saqlash maqsadida <pre> </pre> tegi ishlatiladi. Bu teg nafaqat probellar, balki matnning oldindan formatlangan holatini, har xil surishlar bajarilgan bo'lsa, ularning holatini saqlab qolish uchun ham ishlatiladi.

Javob: probellarni o'z o'rnida saqlaydi.

34. Quyidagi HTML-hujjat kodi yozilishi bo'yicha kataklar ketma-ket sanalganda nechanchi katakda tartiblangan ro'yxat ishlatilgan?

```
<table> <tr> <td colspan=2> <u> <ol> <li> test </ol>
</u> </td> <td rowspan=2> <b> <ul> <li> test </ul>
</b> </td> </tr> <tr> <td> <i> <dl> <dt> test
</dl> </i> </td> <td> <sub> <dl> <dd> test </dl>
</sub> </td> </tr> </table>
```

Yechish:
<td> va </td> bu teglar juftligi jadvalning har bir yacheykasi uchun matn ajratadi; » – raqamlangan ro'yxatni yaratish uchun (inglizcha «Ordered List») foydalaniladi.

1-katak: <tr> <td colspan=2> <u>   test </u> </td>
2-katak: <td rowspan=2>   test </td> </tr>
3-katak: <tr> <td> <dl> <dt> test </dl> </td>
4-katak: <td> _{<dl> <dd> test </dl>} </td> </tr>

Javob: birinchi katakda.

35. MS Excel. A1 = 23, B1 = 9 bo'lsa, =?(Остат(A1;B1+??(Сцепить(A1;B1));2) formulaning natijasi 24 bo'lishi uchun ? va ?? belgilarining o'rniga qo'yish mumkin bo'lgan funksiyalar to'g'ri berilgan javobni aniqlang.

Yechish:

ЛЕВСИМВ(matn; belgi soni)	*Matnning chap tomonidagi berilgan sondagi belgilarni ajratib oladi*
ЗНАЧЕН(matn)	*Matn ko'rinishidagi sonni songa o'tkazadi*
ДЛСТР(matn)	*Matndagi belgilar sonini aniqlaydi*
СТЕПЕНЬ(son; daraja ko'rsatkichi)	*Sonni darajaga ko'taradi*
СРЗНАЧ(son1; son2;...)	*son1, son2, ... larning o'rta arifmetik qiymatini aniqlaydi*
ЗНАК(son)	*Son manfiy bo'lsa –1, 0 bo'lsa 0, musbat bo'lsa 1 qiymatga teng*
СЦЕПИТЬ(matn1; matn2;...)	*Bir nechta matnlarni ketma-ket ulaydi*
ОСТАТ(son; bo'luvchi)	*Sonni bo'luvchiga bo'lgandagi qoldiqni hisoblaydi*

=?(остат (A1;B1)+??(Сцепить (A1;B1));2) formulani 2 bo'lakka bo'lib qaraymiz:

=Остат (A1;B1) *(1)*
=Сцепить (A1;B1) *(2)*

(1) formula natijasini hisoblaymiz: 23 ni 9 ga bo'lganda qoldiq 5 ga teng.
(2) formulaning javobi matnli ifoda bo'lib, '239' ga teng. Matnli ifodani songa aylantirish uchun ?? o'rnida ЗНАЧЕН(matn) funksiyasidan foydalanamiz: =ЗНАЧЕН('239')=

(1) va (2) ni qo'shsak, 5 + 239 = 244. Matnning chap tomonidagi 2 ta belgilarni ajratib olsak, 24 hosil bo'ladi. Demak, ? o'miga ЛЕВСИМВ('244';2) funksiyasini qo'yish kerak.

Javob: Левсимв, Значен.

36. Bir terabayt necha gigabaytga teng?

Yechish:

Axborot o'lchov birliklarini esga olamiz:

Bit = 0 yoki 1

Bayt = 8 bit

Kilobayt = 2^{10} *bayt*

Megabayt = 2^{10} *kilobayt*

Gigabayt = 2^{10} *megabayt*

Terabayt = 2^{10} *gigabayt*

Javob: 2^{10} gigabayt