Часть 1

Олимпиада: **Математика, 11 класс (1 часть)**

Шифр: **21102550**

ID профиля: **802126**

Вариант 21

11 класс. Вариант 21. Ч 1. Чистовик

1

№1. $S=\frac{2a_1+d\cdot 6}{2}\cdot 7=7a_1+21d$

$a_8\cdot a_{17}=(a_1+7d)(a_1+16d)=a_1^2+23da_1+\cancel{112d^2}+112d^2$

$a_{11}\cdot a_{14}=(a_1+10d)(a_1+13d)=a_1^2+23da_1+130d^2$

$$\begin{cases} a_1^2+23da_1+112d^2>7a_1+21d+27 \\ a_1^2+23da_1+130d^2<7a_1+21d+60 \end{cases}$$

$a_1^2+23da_1+112d^2+7a_1+21d+60>7a_1+21d+27+a_1^2+23da_1+130d^2$

$112d^2+60>27+130d^2$

$18d^2<33$

Т.к прогрессия возр, то $d>0$ $\Big\}$ $d=1$. ($d\in\mathbb{Z}$, т.к по усл. все члены арифм. пр. целые)

при $d=1$:

$S=7a_1+21$

$$\begin{cases} a_8\cdot a_{17}=(a_1+7)(a_1+16)=a_1^2+23a_1+112>7a_1+21+27 \\ a_{11}\cdot a_{14}=(a_1+10)(a_1+13)=a_1^2+23a_1+130<7a_1+21+60. \end{cases}$$

$$\begin{cases} a_1^2+16a_1+64>0 \\ a_1^2+16a_1+49<0 \end{cases}$$

$(a_1+8)^2>0$, $a\neq-8$. (*)

$\frac{D}{4}=64-49=15$

$a_1=-8\pm\sqrt{15}$

$-5<\sqrt{15}-8<-4$, т.к: $-12<-\sqrt{15}-8<-11$, т.к:

1. $\sqrt{15}-8 \vee -4$. $\sqrt{9}<\sqrt{15}<\sqrt{16}$

$\sqrt{15}\vee 4$ $-4<-\sqrt{15}<-3$.

$\sqrt{15}<\sqrt{16}$

2. $\sqrt{15}-8\vee -5$.

$\sqrt{15}\vee 3$

$\sqrt{15}\vee\sqrt{9}$

$\sqrt{15}>\sqrt{9}$

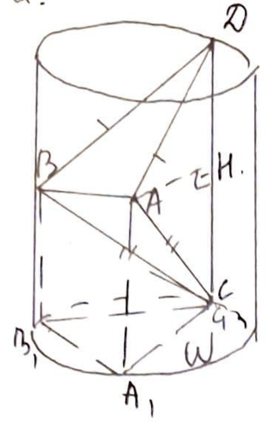
из $(-12;-4)$

Т.к $a_1\in\mathbb{Z}$ по усл, то подходят

$a_1=-11,-10,-9,-8,-7,-6,-5$

но: $a_1\neq-8$, т.к * Ответ: $-11;-10;-9;-8;-7;-6;-5$.

№2. 11 класс В 21 Ч 1 чистовик



1. Заметим, что AB лежит в пл-ти $\perp DC$, т.к $DA = DB$, $AC = BC$.

2. Т.к $DC \parallel$ оси цилиндра, то $DC \perp (\omega)$

Спроецируем т A, т. B и т C на ω

Получим $\Delta A_1B_1C_1$ с ω

пусть R - радиус основания цилиндра.

$$2R = \frac{B_1A_1}{\sin \angle A_1C_1B_1}$$

~~BA~~ из п. 1, п. 2 $BA \parallel \omega$, поэтому ~~т.к~~ $\left.\begin{array}{l} B_1A_1 \parallel BA \\ AA_1 \parallel BB_1 \perp \omega \end{array}\right\} \Rightarrow$

$\Rightarrow BAA_1B_1$ - паралл:

$BA = B_1A_1 = 4$.

$$2R = \frac{4}{\sin \angle A_1C_1B_1}$$

чтобы $R \to max$ $\sin \angle A_1C_1B_1 = 1$.

$\angle A_1C_1B_1 = 90°$

$A_1C_1 = C_1B_1 = \sqrt{8} = 2\sqrt{2}$.

тогда $AH = 2\sqrt{2}$.

$C\cancel{R} = \sqrt{25 - 8} = \sqrt{13}$

$DH = \sqrt{36 - 8} = \sqrt{28}$

$DC = CH + DH = \sqrt{13} + \sqrt{28}$

$S_7 \quad a_8 a_{17} > S+27.$

$a_{11} a_{14} < S+60.$

$\begin{array}{r} 16 \\ \times 7 \\ \hline 112 \end{array}$

$S_7 = \frac{2a_1 + d\cdot 6}{2} \cdot 7 = 7a_1 + 21d$

$a_8 \cdot a_{17} = (a_1 + d\cdot 7)(a_1 + d\cdot 16)$

$a_{11} a_{14} = (a_1 + 10d)(a_1 + 13d)$

$d > 0$

$\begin{cases} \underbrace{a_1^2 + 23a_1 d}{} + d^2 112 > \underbrace{7a + 21d}{} + 27. \\ \cancel{a_{11} \mp \sqrt{n}} \\ \underbrace{a_1^2 + 23a_1 d}{} + 130d^2 < \underbrace{7a + 21d}{} + 60 \end{cases}$

$\cancel{a_1^2} + \cancel{23a_1 d} + d^2 112 + \cancel{7a} + \cancel{21d} + 60 > \cancel{7a} + \cancel{21d} + 27 + \cancel{a_1^2} + \cancel{23a_1} d + 130d^2$

$18d^2 < 60 - 27 = 33. \qquad 18d^2 < 33$

$\begin{array}{r} 112 \\ - 48 \\ \hline 64 \end{array} \qquad \begin{array}{r} 21 \\ + 27 \\ \hline 48 \end{array}$

$\underline{d=1}; \quad \underline{d=0}; \quad \underline{d=-1}$

$S_7 = 7a_1 + 21$

$a_8 \cdot a_{17} = (a_1 + 7)(a_1 + 16)$

$a_{11} \cdot a_{14} = (a_1 + 10)(a_1 + 13)$

$\begin{cases} a_1^2 + 23a_1 + 112 > 7a_1 + 21 + 27. \\ a_1^2 + 23a_1 + 130 < 7a_1 + 21 + 60. \end{cases}$

$a_1^2 + 16a_1 + 64 > 0.$

$a_1^2 + 16a_1 + 49 < 0$

$(a_1 + 8)^2 > 0. \quad a_1 \neq -8.$

$\frac{D}{4} = 64 - 49 = 15.$

$a_1 = -8 \pm \sqrt{15}$

$-\sqrt{15} - 8 \qquad \sqrt{15} - 8$

$\cancel{-11} \ V -\sqrt{15} - 8. \qquad \sqrt{15} - 8 \ V -1.$

$3 \ V -\sqrt{15}. \qquad \sqrt{15} \ V \ 7 \qquad 6$

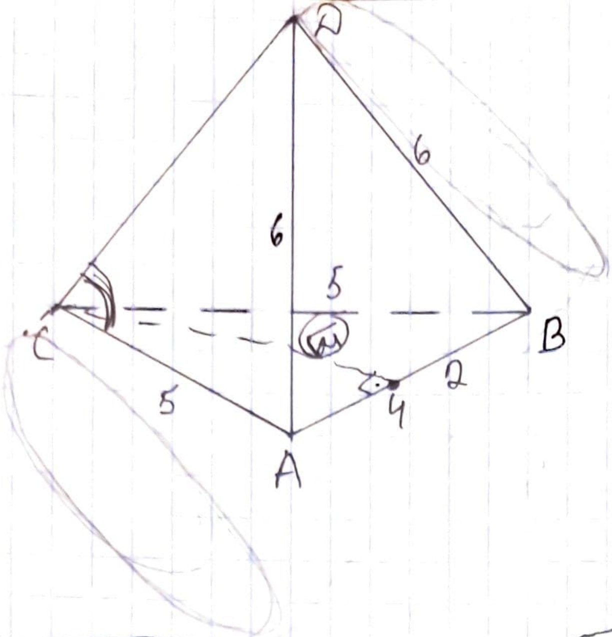
$\sqrt{15} - 8 \ V -2. \qquad -6$

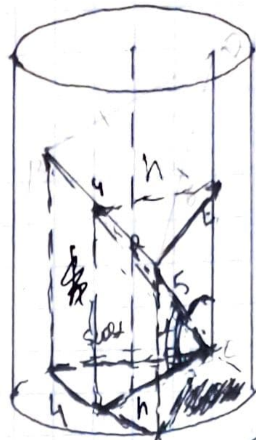
$\sqrt{15} \ V \ 6 \qquad -7$

$\sqrt{15} - 8 \ V -5. \qquad \cancel{-8}$

$\sqrt{15} \ V \ 3. \qquad -9 \ -11$

-10





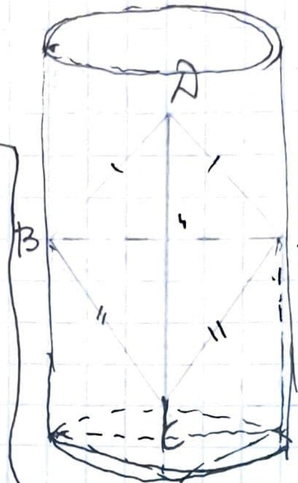
$S = \frac{abc}{4R}$

$4R = \frac{abc}{S}$

$\cos\alpha = \frac{h}{\sqrt{21}}$

$S_n = S\cos\alpha$

$S = \sqrt{7\cdot 2\cdot 2\cdot 3} = 2\sqrt{21}$



$\cancel{\frac{5^2\cos^2\alpha\cdot 4\cos^2\alpha}{S\cos\alpha}} =$

$\cancel{\frac{100\cos^2\alpha}{S}}$

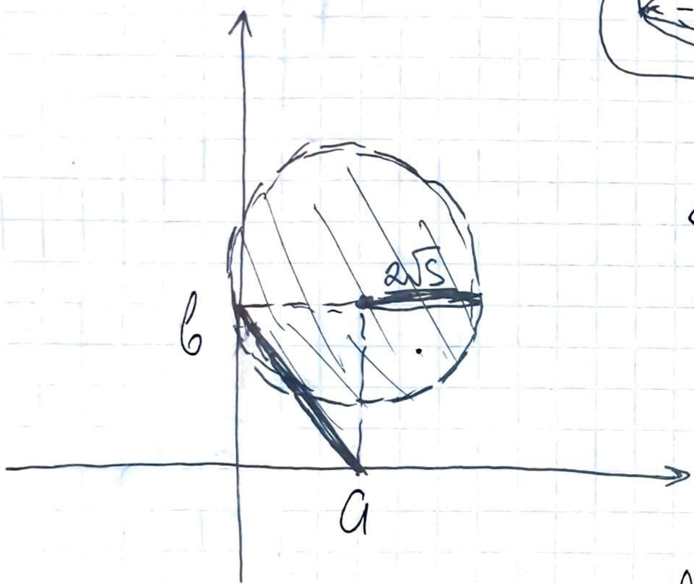
$\cancel{S = 2\sqrt{21}}$

$\cancel{\alpha = 90}$

$\frac{5^2\cos^2\alpha\cdot 4}{S\cos\alpha} = \frac{100\cos\alpha}{S}$

$R = \frac{2S\cos\alpha}{2\sqrt{21}}$

$$\begin{cases}(x-a)^2+(y-b)^2\le 20\\ a^2+b^2\le \min(8a-4b,\ 20)\end{cases}$$



$\sqrt{20} = 2\sqrt{5}$

$8a-4b\ge 0$

$2a-b\ge 0$

$2a\ge b$

$b\le 2a$

$$\begin{cases}a^2+b^2\le 8a-4b\\ a^2+b^2\le 20\end{cases}$$

$8a-4b\le 20$

$2a-b\le 5$

$\cancel{x^2-2ax+a^2+y^2-2by+b^2\le 20}$

$\sqrt{a^2+b^2}\le 2\sqrt{5}$

$b\le 2a$

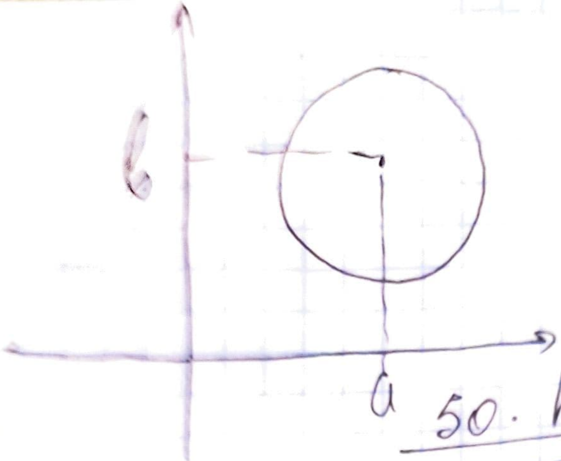
$2a-5\le b$

$8a-4b>20.$

$2a-b>5$

$(2a-b+5)$

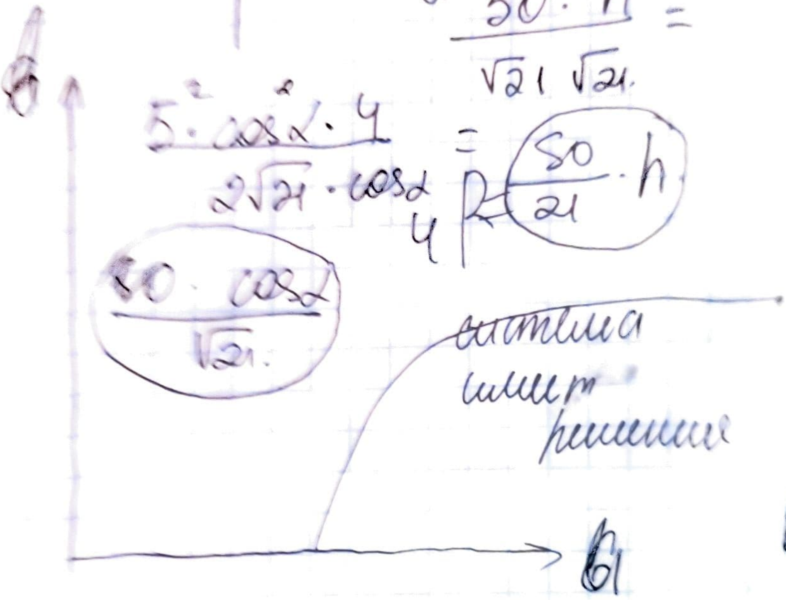
1. $b \le 2a$
2.



$\frac{50\cdot h}{\sqrt{21}\sqrt{21}} =$

$\frac{5^2\cdot\cos^2\alpha\cdot 4}{2\sqrt{21}\cdot\cos\alpha} = \frac{50}{21}\cdot h$

$\frac{50\cdot\cos\alpha}{\sqrt{21}}$

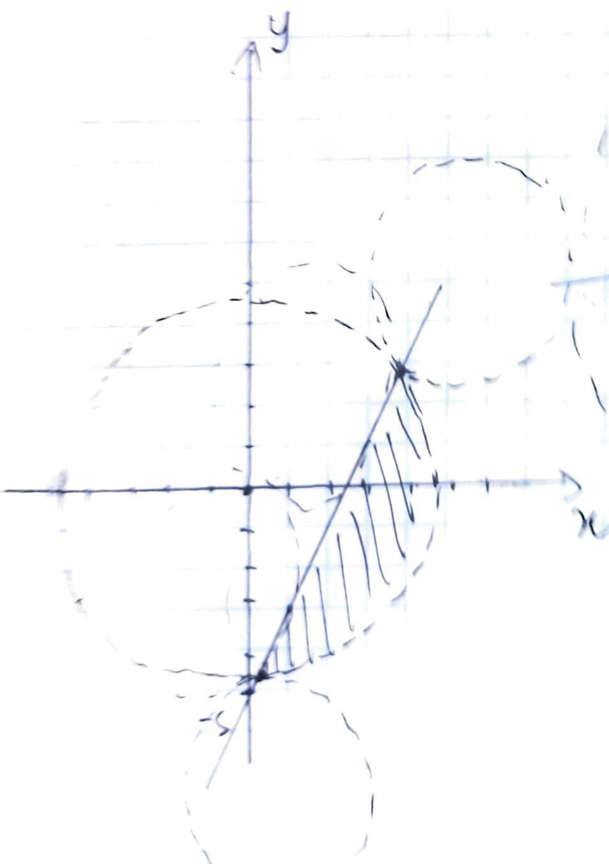


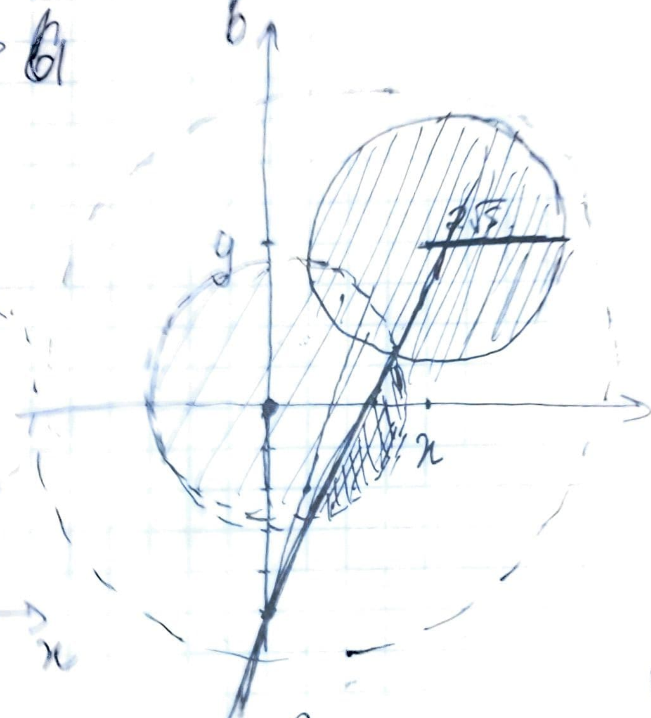
$\begin{cases} a^2+b^2 \le 20 \\ 8a-4b>20 \end{cases}$

$\begin{cases} a^2+b^2 \le 8a-4b \\ 8a-4b<20 \end{cases}$

$a^2+b^2 \le 20.$

$\begin{cases} (a-x)^2+(b-y)^2 \le 20. \\ a^2+b^2 \le \min(8a-4b, 20) \end{cases}$





$8a-4b>20$

$2a-b>5.$

$\cancel{2a>}$

$b < 2a-5.$

$2a-b<5$

$b>2a-5$

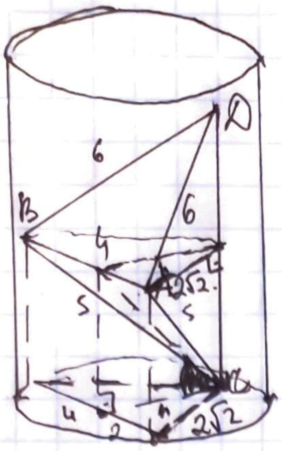
$\sqrt{20}=2\sqrt{5}$

$\begin{cases} a^2+b^2 \le \cancel{\min}(8a-4b) \\ a^2+b^2 \le 20. \end{cases}$ $2\sqrt{5}$

$\sqrt{20}$

$\cancel{8a-4b}$

$\begin{cases} a^2+b^2 \le 8a-4b \\ b>2a-5 \end{cases}$



$$4R = \frac{abc}{S} = \frac{ac^2}{S}$$

4

$$S_n = S\cos\alpha$$

$$\begin{array}{r} 112 \\ -\ 48 \\ \hline 6.4 \end{array}$$

$$2R = \frac{a}{\sin\alpha} \qquad \sin\alpha \longrightarrow \max$$

$$\alpha = 90^\circ.$$

$$a^2 + a^2 = 16$$

$$a^2 = 8 \qquad \boxed{a = 2\sqrt{2}}$$

Часть 2

Олимпиада: **Математика, 11 класс (2 часть)**

Шифр: **21102550**

ID профиля: **802126**

Вариант 21

№5. $\log_{\sqrt{2x-3}}(x+1)$, $\log_{2x^2-3x+5}(2x-3)^2$, $\log_{x+1}(2x^2-3x+5)$

$\log_{\sqrt{2x-3}}(x+1)\cdot\log_{(2x^2-3x+5)}(2x-3)^2\cdot\log_{x+1}(2x^2-3x+5)=$

$=4$

Чистовик 1
Кл 11. В 21. Ч 2

Огранич.: $\begin{cases} x+1>0 \\ 2x-3>0 \\ 2x-3\neq 1 \\ 2x^2-3x+5>0 \\ 2x^2-3x+5\neq 1 \\ 2x-3\neq 0 \\ x+1\neq 1 \end{cases}$; $\begin{cases} x>1{,}5 \\ x\neq 2 \end{cases}$

пусть один из чисел a, тогда другие a, $a-1$.

их произведение: $a\cdot a\cdot(a-1)=a^3-a^2$

$a^3-a^2=4$

$a^3-a^2-4=0$ $\quad (a-2)(a^2+a+2)=0$

$a=2.$

1. пусть $\log_{\sqrt{2x-3}}(x+1)=2.$

$x+1=2x-3$

$x=4$ - подходит с учетом огр.

2. пусть $\log_{2x^2-3x+5}(2x-3)^2=2.$

$(2x-3)^2=(2x^2-3x+5)^2$

$(2x-3-2x^2+3x-5)(2x-3+2x^2-3x+5)=0$

$(-2x^2+5x-8)(2x^2-x+2)=0$

$(2x^2-5x+8)(2x^2-x+2)=0$

$\left[\begin{array}{l} 2x^2-5x+8=0 \quad D<0 \text{ корней нет} \\ 2x^2-x+2=0 \quad D<0 \text{ корней нет.} \end{array}\right.$

3. пусть $\log_{x+1}(2x^2-3x+5)=2.$

$2x^2-3x+5=(x+1)^2$

$2x^2-3x+5=x^2+2x+1$

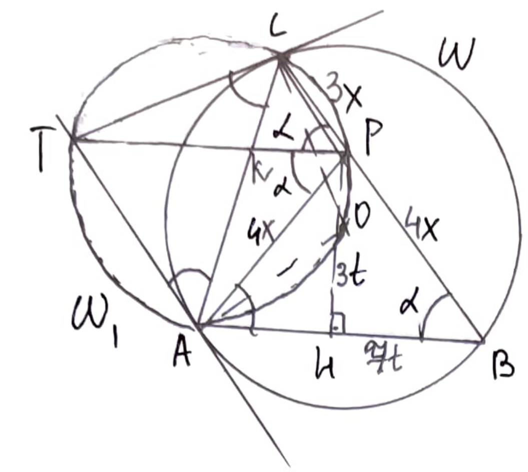
$x^2-5x+4=0$

$\left[\begin{array}{l} x=1 \text{ - не подходит} \\ x=4 \end{array}\right.$

Ответ: 4

Чистовик 2

№6



1. W: $\angle TCA$ - угол между хордой AC и касат TC

$\angle TCA = \frac{1}{2} \smile CA$

аналогично $\angle CAT$ - угол между х. AC и касат AT

$\angle CAT = \frac{1}{2} \smile CA$

$\angle CAT = \angle TCA$

2. OC - радиус, провед в т. касания C: $OC \perp CT$

OA - рад, ——— " ——— A: $OA \perp AT$

$\angle OCT = \angle OAT = 90^\circ$; $\angle OCT + \angle OAT = 180^\circ \Rightarrow OCTA$ - вписанный $\Rightarrow T \in W_1$

3. W_1: $\angle TPA$ - впис, $\angle TPA = \frac{1}{2} \smile TA = \angle TCA$

$\angle CPT$ - впис, $\angle CPT = \frac{1}{2} \smile CT = \angle CAT$

$\angle TCA = \angle CAT$

$\Rightarrow \angle TPA = \angle CPT$

4. W: $\angle CBA = \frac{1}{2} \smile CA = \angle CAT = \angle TCA$

5. $\angle CPA$ - внешний для $\triangle APB$: $\angle CPA = \angle PBA + \angle PAB$

$\angle PBA = \frac{1}{2} \angle CPA$

$\Rightarrow \angle PAB = \angle PBA = \frac{1}{2} \angle CPA$

тогда $\triangle APB$ - р/б

6. $\triangle CPK$: $\frac{1}{2} CP \cdot PK \cdot \sin\alpha = 9$

$\triangle KPA$: $\frac{1}{2} \cdot PK \cdot PA \cdot \sin\alpha = 12$

$\Rightarrow \frac{PC}{PA} = \frac{3}{4}$, пусть $CP = 3x$, тогда $PA = 4x = PB$.

7. $\angle CPA + \angle APB = 180^\circ \Rightarrow \sin\angle CPA = \sin\angle APB = \sin 2\alpha$

$S_{\triangle ACP} = S_{CKP} + S_{AKP} = 12 + 9 = 21$.

$\frac{1}{2} \cdot 3x \cdot 4x \cdot \sin 2\alpha = 21 - S_{\triangle ACP}$

$\frac{1}{2} \cdot 4x \cdot 4x \cdot \sin 2\alpha = S_{APB}$

$\Rightarrow \frac{S_{APB}}{S_{\triangle ACP}} = \frac{16}{12}$

$S_{\triangle APB} = \frac{16 \cdot 21}{12} = 28$

$S_{\triangle ABC} = 28 + 21 = 49$.

2. PH - высота и медиана.

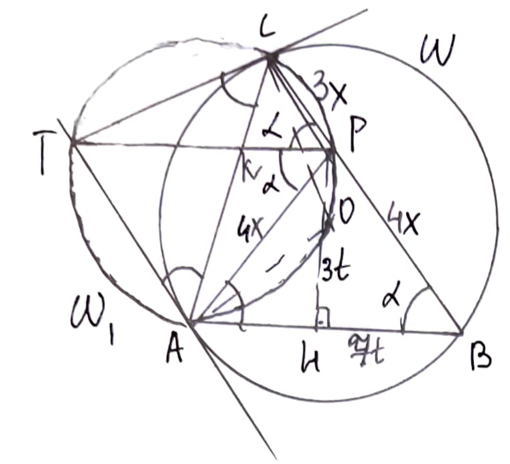
$\frac{PH}{HP} = tg \angle ACB = \frac{3}{7}$

Т. Пифагора: $9t^2 + 49t^2 = 16x^2$

$t^2 = \frac{16x^2}{58}$; $t = \frac{4x}{\sqrt{58}}$

11 класс. В 21. Ч 2. Чистовик ②

№6



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$$\angle CAT = \frac{1}{2} \cup CA$$

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OA - рад, ——— // ——— A: $OA \perp AT$

$\angle OCT = \angle OAT = 90°$; $\angle OCT + \angle OAT = 180° \Rightarrow OCTA$ - вписанный $\Rightarrow T \in W_1$

3. W_1: $\angle TPA$ - впис, $\angle TPA = \frac{1}{2} \cup TA = \angle TCA$

$\angle CPT$ - впис, $\angle CPT = \frac{1}{2} \cup CT = \angle CAT$

$\angle TCA = \angle CAT$ $\Rightarrow \angle TPA = \angle CPT$

4. W: $\angle CBA = \frac{1}{2} \cup CA = \angle CAT = \angle TCA$

5. $\angle CPA$ - внешний для $\triangle APB$: $\angle CPA = \angle PBA + \angle PAB$, $\angle PBA = \frac{1}{2} \angle CPA$ $\Rightarrow \angle PAB = \angle PBA = \frac{1}{2} \angle CPA$, тогда $\triangle APB$ - р/б

6. $\triangle CPK$: $\frac{1}{2} CP \cdot PK \cdot \sin\alpha = 9$

$\triangle KPA$: $\frac{1}{2} \cdot PK \cdot PA \cdot \sin\alpha = 12$ $\Rightarrow \frac{PC}{PA} = \frac{3}{4}$, пусть $CP = 3x$, тогда $PA = 4x = PB$.

7. $\angle CPA + \angle APB = 180° \Rightarrow \sin\angle CPA = \sin\angle APB = \sin 2\alpha$

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2. PH - высота и медиана.

$\frac{PH}{HB} = tg\angle ACB = \frac{3}{7}$ Т. Пифагора: $9t^2 + 49t^2 = 16x^2$

$t^2 = \frac{16x^2}{58}$; $t = \frac{4x}{\sqrt{58}}$

$AB = 14t = \frac{56x}{\sqrt{58}}$ 11 кл. В 21. 4 г. Чистовик (3)

$\cos\alpha = \frac{7}{\sqrt{58}}$

$\sin\alpha = \sqrt{1 - \frac{49}{58}} = \frac{3}{\sqrt{58}}$

$\frac{1}{2}\cdot \sin\alpha \cdot AB \cdot BC = 49$

$\frac{1}{2}\cdot\frac{3}{\sqrt{58}}\cdot\frac{56x}{\sqrt{58}}\cdot 7x = 49$

$x^2 = \frac{\cancel{2}\cdot 58\cdot \cancel{49}^{7}}{3\cdot \cancel{56}_{28}\cdot\cancel{7}} = \frac{58\cdot 7}{28\cdot 3} = \frac{58}{12}$; $x = \sqrt{\frac{58}{12}}$

$AC^2 = AB^2 + BC^2 - 2AB\cdot BC\cdot\cos\alpha$

$AC^2 = \frac{56^2\cdot 58}{12\cdot 58} + 49\cdot\frac{58}{12} - 2\cdot\frac{56x}{\cancel{\sqrt{58}}}\cdot\frac{\sqrt{58}}{\sqrt{12}}\cdot 7\cdot\frac{\cancel{\sqrt{58}}}{\sqrt{12}}\cdot\frac{7}{\cancel{\sqrt{58}}}$

$AC^2 = \frac{56^2}{12} + \frac{49\cdot 58}{12} - \frac{2\cdot 56\cdot 49}{12}$

$AC^2 = \frac{56^2 + 49\cdot 58 - 2\cdot 56\cdot 49}{12} = \frac{490}{12}$

Ответ: $AC = \sqrt{\frac{490}{12}}$

$\begin{cases} \text{НОД}(a, b, c) = 35 \\ \text{НОК}(a; b; c) = 5^{18} \cdot 7^{16} \end{cases}$

$a = 35 \cdot x$

$b = 35 \cdot y$

$c = 35 \cdot z$

x, y, z — взаимно простые $\in \mathbb{N}$

$35 = 5 \cdot 7$

$x =$

$y =$

$z =$

$x / y / z \quad 5^{17} \cdot 7^{15}$

пусть $a = 35 \cdot 5^{17} \cdot 7^{15}$

$b = 35 \cdot \boxed{16 \cdot 15}$

$c = 35 \cdot \boxed{16 \cdot 14}$

$\cdot 3$

$\cancel{+1}$

$a = b = c$

$a = 35 \cdot 5^{17} \cdot 7^{15}$

$b = 35 \cdot 5^{17} \cdot 7^{15}$

$c = 35 \cdot \boxed{16 \cdot 14}$

$\times 3$

$1 \cdot \boxed{16 \cdot 14} \cdot \boxed{16 \cdot 14} \cdot 3 +$

$+ 16 \cdot 14 \cdot 3 + 1.$

$\underset{a}{\log_{\sqrt{2x-3}}(x+1)}, \quad \underset{b = a}{\log_{2x^2-3x+5}(2x-3)^2}, \quad \underset{c = a-1.}{\log_{x+1}(2x^2-3x+5)}$

$a = b \qquad a + b + c = 2a - 1.$

$c = a - 1.$

$\boxed{a, \quad a, \quad a-1.} = 3a - 1.$

$\log_{\sqrt{2x-3}}(x+1) = \log_{2x^2-3x+5}(2x-3)^2$

$a^2(a-1)$

1) $\log_{\sqrt{2x-3}}(x+1) = \log_{2x^2-3x+5}(2x-3)^2$ и

$\log_{\sqrt{2x-3}}(x+1) - \log_{2x^2-3x+5}(2x-3)^2 = 1. \qquad 2x^2 - 3x + 4 = 0.$

$\log_{\sqrt{2x-3}}(x+1) \cdot \log_{(x+1)}(2x^2-3x+5) \cdot \log_{2x^2-3x+5}(2x-3)^2 =$

$= \log_{\sqrt{2x-3}}(2x^2-3x+5) \cdot \log_{2x^2-3x+5}(2x-3)^2 = 4.$

$\triangle CKP \sim \triangle TKA$

$\frac{CP}{TA} = \frac{Ck}{KT} = \frac{KP}{KA} = \cancel{\frac{4}{3}}$

$\frac{3t}{KT} = \frac{KP}{4t}$

$\frac{Pk}{kC} = \frac{AP}{TC} = \frac{kA}{kT}$

$\frac{AB}{AC} = \frac{BP}{CT} = \frac{PA}{TA}$

$\frac{1}{2} \cdot 4x \cdot 3x \sin y = 21$

$\frac{1}{2} \cdot 4x \cdot 4x \sin y = S.$

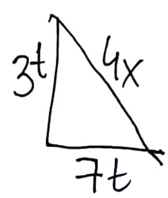
$\frac{16}{12} = \frac{S}{21}$

$S = \frac{16 \cdot 21}{12} = 28$

$\cancel{\frac{1}{2}\,4x \cdot 3}x \cdot \sin 2y = 21$

$\angle ABC = \operatorname{arctg} \frac{3}{7}$

$14 \cdot 4 = 56$



$49t^2 + 9t^2 = 16x^2$ $\quad 58 = 49 + 9$

$58t^2 = 16x^2$ $\quad 58 = 2 \cdot 29 =$

$t = \sqrt{\frac{16x^2}{58}} = \frac{4x}{\sqrt{58}}$

$AB = 14 \cdot \frac{4x}{\sqrt{58}} = \frac{56x}{\sqrt{58}}$

$t = \frac{4x}{\sqrt{58}}$

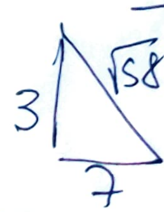
$\cancel{16x^2} = \frac{56^2 x^2}{58} + \cancel{16x^2} - 2 \cdot \frac{56x}{\sqrt{58}} \cdot 4x \cdot \cos\alpha.$

$\frac{2 \cdot 56}{\sqrt{58}} \cdot 4 \cdot \cos\alpha = \frac{56^2 \cancel{x^2}}{58}.$ $\quad 2 \cdot 56 \cdot 4 \cdot \cos\alpha = \frac{56^2}{58} \cdot \sqrt{58}$

$\cos\alpha = \frac{56^2 \sqrt{58}}{58 \cdot 4 \cdot 2 \cdot 56} = \frac{7\sqrt{58}}{58} = \frac{7}{\sqrt{58}}$ $\quad \sqrt{9+49} = \sqrt{58}$

$\frac{2 \cdot 58 \cdot 49}{3 \cdot 8 \cdot 49}$

$\sin\alpha = \sqrt{1 - \frac{49}{58}} = \sqrt{\frac{9}{58}} = \frac{3}{\sqrt{58}}$



$S = \frac{1}{2} \cdot \frac{3}{\sqrt{58}} \cdot \frac{56x}{\sqrt{58}} \cdot 7x = \frac{21 \cdot 56 \cdot x^2}{2 \cdot 58} = 28.$

$x^2 = \frac{2 \cdot 58 \cdot 28}{21 \cdot 56} = \frac{58}{21}.$ $\quad BC = \frac{7 \cdot \sqrt{58}}{\sqrt{21}} = \cancel{\sqrt{\frac{58 \cdot 49}{7 \cdot 3}}}$

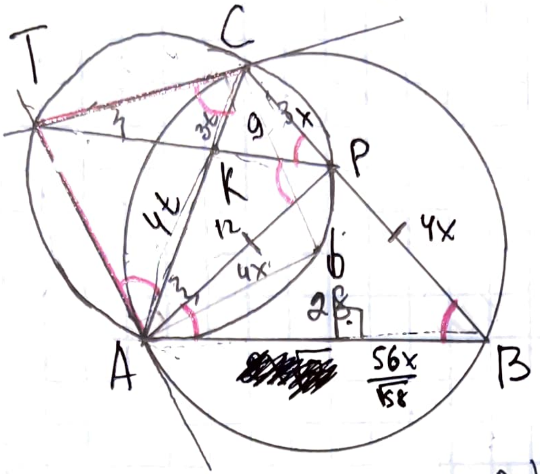
$AB = \frac{56}{\sqrt{58}} \cdot \frac{\sqrt{58}}{\sqrt{21}} = \frac{56}{\sqrt{21}}$

$x = \sqrt{\frac{58}{21}}.$

① $\frac{CP \cdot PK}{KP \cdot PA} = \frac{9}{12}$ $\frac{PC}{PA} = \frac{3}{4}$.

$CP \cdot PA \cdot \sin 2\alpha = 21$.

$CT^2 \sin 2\alpha = S$.



$\cancel{BP(BP + CB) = AB^2}$

$\cancel{PA^2 + PA \cdot CP = AB^2}$.

$\cancel{4x \cdot 7x = \frac{21}{\sin 2\alpha}}$ $\cancel{16 - 7 = 9}$

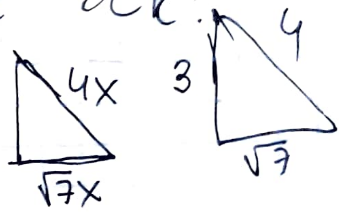
$\cancel{= 28x^2}$

$\cancel{\frac{AT}{CB} = \frac{AK}{}}$

$\cancel{\frac{AP}{AK} = \frac{PC}{CK}}$.

$\frac{AB}{CA} =$

$\cancel{\frac{CT}{AP} = \frac{AK}{KP} = \frac{KT}{KA}}$



$\cancel{\frac{KP \cdot AP}{KP \cdot PC} = \frac{12}{9} = \frac{4}{3}}$

$\cancel{\frac{AP}{PC} = \frac{4}{3}}$.

PA

$12 = \frac{1}{2} \cdot KP \cdot \frac{3}{4}$

$KP \cdot PA = 32$

$9 = \frac{1}{2} \cdot KP \cdot CP \cdot \frac{3}{4}$. $\cancel{12 : 8}$

$12 \cdot 8 = 3$

$KP \cdot CP = 24$.

$\log_{(x+1)}(2x^2 - 3x + 5) = 2$.

$2x^2 - 3x + 5 = (x+1)^2$

$2x^2 - 3x + 5 = x^2 + 2x + 1$

$x^2 - 5x + 4 = 0$.

$x = 1$

$x = 4$