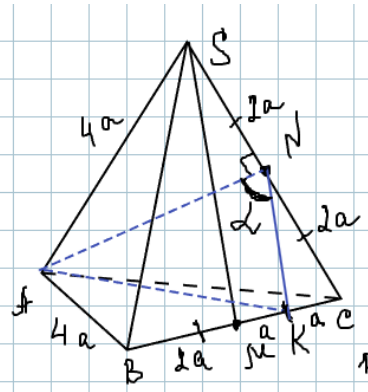
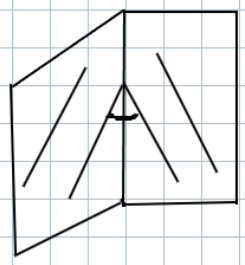
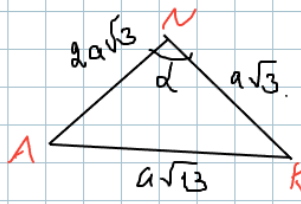
22.2.





1. $SM \parallel NK$; $(AN \wedge SM) = (AN \wedge NK)$



1. $AB = 4a$.

2. ΔASN

3. $\sin 60^\circ = \frac{AN}{AS}$; $\frac{\sqrt{3}}{2} = \frac{AN}{4a}$ $AN = 2a\sqrt{3}$.

ΔABK. $AK^2 = (4a)^2 + (3a)^2 - 2 \cdot 4a \cdot 3a \cdot \cos 60^\circ$.

$(a\sqrt{13})^2 = (2a\sqrt{3})^2 + (a\sqrt{3})^2 - 2 \cdot 2a\sqrt{3} \cdot a\sqrt{3} \cdot \cos\alpha$ $AK^2 = 16a^2 + 9a^2 - 12a^2$

$AK^2 = 13a^2$

$AK = a\sqrt{13}$.

$13a^2 = 12a^2 + 3a^2 - 12a^2 \cos\alpha$.

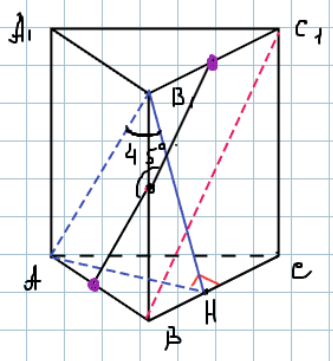
$12a^2 \cos\alpha = 15a^2 - 13a^2 = 2a^2$

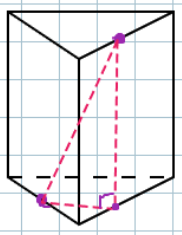
$\cos\alpha = \frac{2a^2}{12a^2} = \frac{1}{6}$

$\alpha = \arccos\frac{1}{6}$

$NK = \frac{1}{2} SM = \frac{1}{2} AN = a\sqrt{3}$

22.3





$AH \perp BC$.

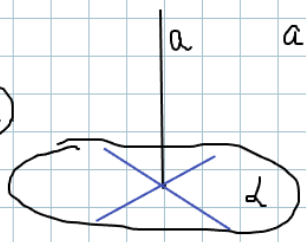
? $AH \perp BB_1C_1C$

$CC_1 \perp ABC \Rightarrow CC_1 \perp AH$

$AH \perp BC$

$AH \perp CC_1 \Rightarrow AH \perp BB_1C_1C$.

$BC \cap CC_1 = C$.



$a \perp \alpha$.

$y = f(x_0) + f'(x_0)(x - x_0)$ общий вид. урав. кас. $y = kx + b$.

$k = f'(x_0) = \operatorname{tg}\alpha$.

4. $y = x^5 + 10x - 3$.

$y' = 5x^4 + 10 > 0$. $y' > 0$, $k > 0$ $\operatorname{tg}\alpha > 0$. α – острый.

5. $y = \frac{1}{1+x^2}$ кас. // оси $X \Rightarrow \alpha = 0 \Rightarrow \operatorname{tg}\alpha = 0 \Rightarrow f'(x_0) = 0$.

$y' = \left((1+x^2)^{-1}\right)' = -1(1+x^2)^{-2} \cdot 2x = \frac{-2x}{(x^2+1)^2} = 0$

$x = 0$.

9. $y = 8\sqrt{x} - 7$ $(1; 3)$. $y = x^2 + 7x - 1$.

$y = |x+2|^2 - 5$

$y = f(x_0) + f'(x_0)(x - x_0)$

x_0 – абс. точки касания

$y = (8\sqrt{x_0} - 7) + \frac{4}{\sqrt{x_0}}(x - x_0)$

$y' = 8 \cdot \frac{1}{2} x^{-\frac{1}{2}} = \frac{4}{\sqrt{x}}$

$y = 8\sqrt{x_0} - 7 + \frac{4}{\sqrt{x_0}} \cdot x - 4\sqrt{x_0}$

$\boxed{y = 4\sqrt{x_0} - 7 + \frac{4}{\sqrt{x_0}} \cdot x}$

$3 = 4\sqrt{x_0} - 7 + \frac{4}{\sqrt{x_0}} \cdot 1$

$\sqrt{x_0} = t$

$0 = 4t - 10 + \frac{4}{t}$

$4t^2 - 10t + 4 = 0$

$2t^2 - 5t + 2 = 0$

$D = 25 - 16 = 9$

$t_{1,2} = \frac{5 \pm 3}{4} = \begin{bmatrix} 2 \\ \frac{1}{2} \end{bmatrix}$

$\sqrt{x_0} = \begin{bmatrix} 2 \\ \frac{1}{2} \end{bmatrix}$ $x_0 = \begin{bmatrix} 4 \\ \frac{1}{4} \end{bmatrix}$

$x_0 = 4$

$y = 8 - 7 + \frac{4}{4}x$

$y = 1 + 2x = 2x + 1$

$x_0 = \frac{1}{4}$.

$y = 2 - 7 + 8x = 8x - 5$

Пересечение

$D > 0$ $D \geq 0$

2. $1 - ax^2 \geq 0$. a – ? нер-во выполнено $x < 1$.

$ax^2 \leq 1$

1) $a < 0$

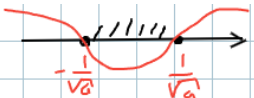
$\forall x$ верно < 0

2) $a = 0$.

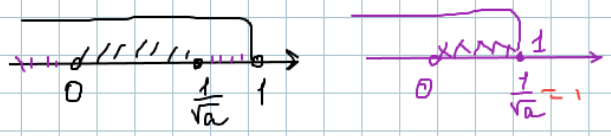
$1 \geq 0$ верно при любом x

3) $a > 0$. $ax^2 \leq 1$. $x^2 \leq \frac{1}{a}$ $x^2 = \frac{1}{a}$; $x = \pm\frac{1}{\sqrt{a}}$

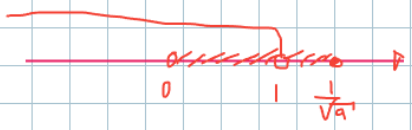
$x^2 \leq \frac{1}{3}$



Если $a>0$ $\quad x \in \left[-\frac{1}{\sqrt{a}};\ \frac{1}{\sqrt{a}}\right]$, отрезок $\quad 0 < x \le \frac{1}{\sqrt{a}}$; $x<1$.



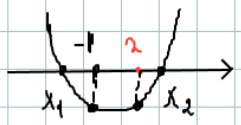
Ответ: $a \le 0$



1. $\underbrace{(k-2)x^2+(k-3)x+k-6}_{f(x)}=0$ $\quad x_1<-1,\ x_2>2$.

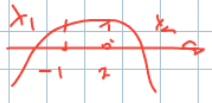
1) $k \neq 2$. Если $k=2$. линейное ур-ние. не уд. усл.

2). $k-2>0$, $k>2$.



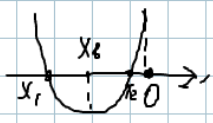
$\begin{cases} f(-1)<0 \\ f(2)<0 \end{cases}$

2) $k<2$



$\begin{cases} f(-1)>0 \\ f(2)>0 \\ k<2 \end{cases}$

$y=f(x)$ $\quad y=kx^2+\dots$, $k>0$.



$x_в=-\frac{b}{2a}$

$\begin{cases} f(0)>0 \\ x_в<0 \\ D>0 \end{cases}$

4) $(a+3,5)x^2+(2a-3)x+a=0$ оба корня положит.

$a \neq -3,5$

3) $a<-3,5$

2) $a>-3,5$

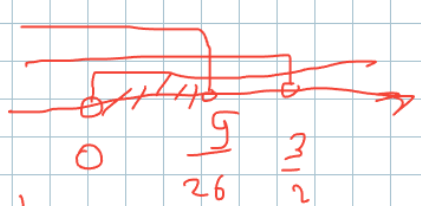
$\begin{cases} a>-3,5 \\ f(0)>0 \\ x_в>0 \\ D>0 \end{cases}$

$a>0$

$D=2\sqrt{6}a>0 \to a<\frac{9}{2\sqrt{6}}$

$\frac{3-2a}{2(a+3,5)}>0$ $\quad 3-2a>0$ $\to a<\frac{3}{2}$

$\begin{cases} a>0 \\ a<\frac{9}{2\sqrt{6}} \\ a<\frac{3}{2} \end{cases}$



$a \in \left(0;\ \frac{9}{26}\right]$

$\begin{cases} a<-3,5 \\ x_в>0 \\ f(0)<0 \\ D>0 \end{cases}$

$f(0)=a$

$D=4a^2-120+9-$

$x_в=\frac{3-2a}{2(a+3,5)}$

$\begin{cases} a<-3,5 \\ a>0 \\ f(0)<0 \\ D>0 \end{cases} \Rightarrow a \in \varnothing$

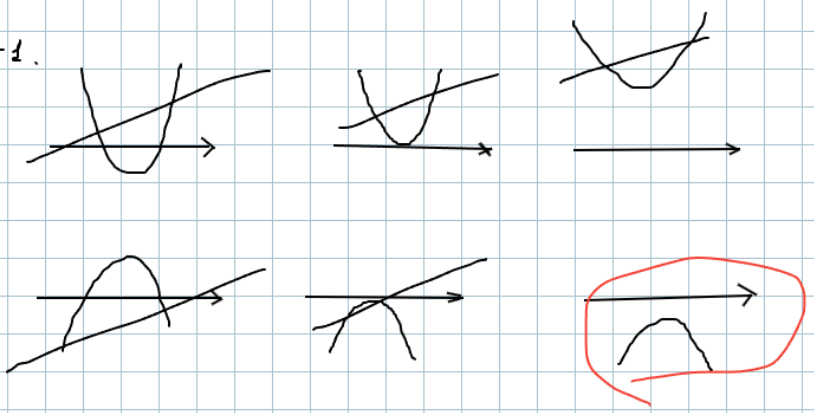
$a=\frac{9}{26}$ $\quad D=0$

$4a^2 - 14a = 9 - 26a$

5. $(-2c-2)x^2+(-c-1)x-c<0$. вып. при любых x

$c=-1$. $1<0$. не выполн.

$c\neq -1$.



$\begin{cases} -2c-2<0 \\ D<0 \end{cases}$