Ур-ие и нерав.

$$\sqrt{f(x)} \geq g(x) \quad \Leftrightarrow \quad \left\{ \begin{array}{l} \left[\begin{array}{l} f(x) \geq (g(x))^2 \\ g(x) \geq 0 \end{array} \right. \\ \left[\begin{array}{l} f(x) \geq 0 \\ g(x) \leq 0 \end{array} \right. \end{array} \right.$$

$$\log_{f(x)} g(x) < \log_{f(x)} h(x) \quad \Leftrightarrow \quad \begin{cases} f(x) > 0 \\ f(x) \neq 1 \\ g(x) > 0 \\ h(x) > 0 \\ (f(x)-1)(g(x)-h(x)) > 0 \end{cases}$$

1.) $|x-3|^{2x^2-7x} > 1$

$\Leftrightarrow$

$|x-3|^{2x^2-7x} > |x-3|^0$

$\Leftrightarrow$

$$\left[\begin{array}{l} \begin{cases} 2x^2-7x > 0 \\ |x-3| > 1 \end{cases} \\ \begin{cases} 0 < |x-3| \leq 1 \\ 2x^2-7x < 0 \end{cases} \end{array} \right. \qquad \left[\begin{array}{l} \begin{cases} x \in (-\infty; 2) \cup (4; +\infty) \\ x \in (-\infty; 0) \cup (\frac{7}{2}; +\infty) \end{cases} \\ \begin{cases} 2 \leq x \leq 4, \quad x \neq 3 \\ x \in (0; \frac{7}{2}) \end{cases} \end{array} \right.$$

2.) $\log_x \left(\frac{4x+5}{6-5x} \right) < -1$

ОДЗ:

$$\begin{cases} x > 0 \\ x \neq 1 \\ 6-5x \neq 0 \\ \frac{4x+5}{6-5x} > 0 \end{cases} \Leftrightarrow \begin{cases} x > 0 \\ x \neq 1 \\ x \neq \frac{6}{5} \\ x \in (-\frac{5}{5}; \frac{6}{5}) \end{cases} \Leftrightarrow \quad x \in (0; \tfrac{6}{5}) / \{1\}$$

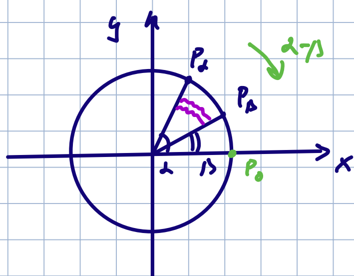
$$\log_x\left(\frac{4x+5}{6-5x}\right) < \log_x \frac{1}{x}$$

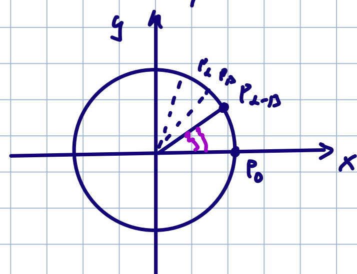
$$\left(\frac{4x+5}{6-5x} - \frac{1}{x}\right)\cdot(x-1) > 0$$

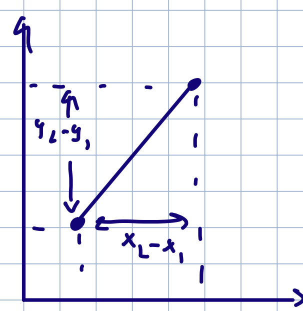
$x \in \left(\frac{1}{2}; 1\right)$

Тригоном.

$\cos(\alpha-\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$







$P_\alpha(\cos\alpha, \sin\alpha)$
$P_\beta(\cos\beta, \sin\beta)$

$P_{\alpha-\beta}[\cos(\alpha-\beta); \sin(\alpha-\beta)]$

$$P_\alpha P_\beta = \sqrt{(\cos\beta-\cos\alpha)^2 + (\sin\beta-\sin\alpha)^2} \qquad (1)$$

$$P_{\alpha-\beta}P_0 = \sqrt{(\cos(\alpha-\beta)-1)^2 + (\sin(\alpha-\beta)-0)^2} \qquad (2)$$

$(1) = (2)$:

$$(\cos\beta-\cos\alpha)^2 + (\sin\beta-\sin\alpha)^2 = (\cos(\alpha-\beta)-1)^2 + \sin(\alpha-\beta)^2$$

$$\cancel{\cos\beta^2} - 2\cos\beta\cdot\cos\alpha + \cancel{\cos^2\alpha} + \cancel{\sin^2\beta} - 2\sin\alpha\sin\beta + \cancel{\sin^2\alpha} = \cos^2\cancel{(\alpha-\beta)} - 2\cos(\alpha-\beta)\cdot 1 + 1 + \sin\cancel{(\alpha-\beta)}^2$$

$1 \quad 1 \quad 1$

$$-2\cos\beta\cos\alpha - 2\sin\alpha\sin\beta = -2\cos(\alpha-\beta)$$

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

1) $\cos x \cos 2x \cos 4x \cos 8x = \frac{1}{8}\cos 15x \quad \Big| \cdot \sin x$

$\frac{1}{2}(2\cdot\sin x\cos x)\cdot\cos 2x\cdot\cos 4x\cdot\cos 8x = \frac{1}{8}\cos 15x\cdot\sin x$

$\frac{1}{2}\cdot\frac{1}{2}(\sin 2x\cdot\cos 2x)\cdot\cos 4x\cdot\cos 8x = \frac{1}{8}\cos 15x\cdot\sin x$

$\frac{1}{4}\cdot\sin 4x\cdot\cos 4x\cos 8x = \frac{1}{8}\cos 15x\cdot\sin x$

$\sin\alpha\cdot\cos\beta = \frac{1}{2}(\sin(\alpha+\beta) - \sin(\alpha-\beta))$

$\frac{1}{16}\sin 16x = \frac{1}{8}\cos 15x\cdot\sin x$

$\begin{cases}\sin(16x) = 2\cos 15x\cdot\sin x \\ \sin x \neq 0\end{cases}$

$\frac{\sin(16x) - \sin(16x) + \sin 14x}{\sin x} = 0$

$\begin{cases}\sin(14x) = 0 \\ \sin x \neq 0\end{cases} \qquad \begin{cases}x = \frac{\pi n}{14} \\ x \neq \pi n\end{cases}, \ n \in \mathbb{Z}$

$\underline{O}$: $x = \frac{\pi n}{14}$, $n \neq 14\ell$

$n, \ell \in \mathbb{Z}$

$\underline{Д\text{-}во:}$

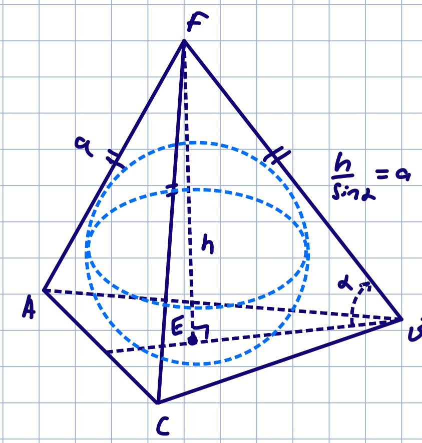
$\sin(\alpha+\beta) = \sin\alpha\cos\beta + \sin\beta\cos\alpha$
$\sin(\alpha-\beta) = \sin\alpha\cos\beta - \sin\beta\cos\alpha$

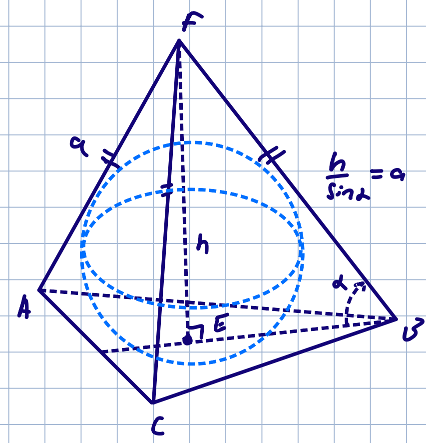
$\sin(\alpha+\beta) - \sin(\alpha-\beta) = \cancel{\sin\alpha\cos\beta} + \sin\beta\cos\alpha - (\cancel{\sin\alpha\cos\beta} - \sin\beta\cos\alpha) = 2\sin\beta\cos\alpha$

$\sin(\alpha+\beta) - \sin(\alpha-\beta) = 2\sin\alpha\cos\beta$

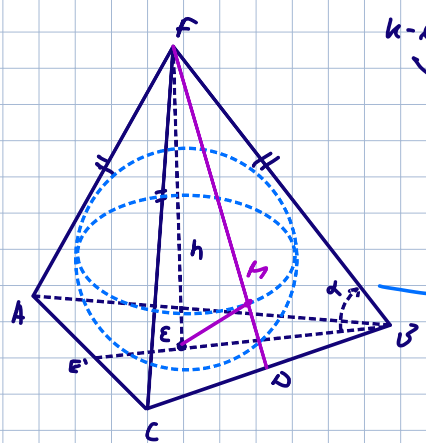
Стереометрия

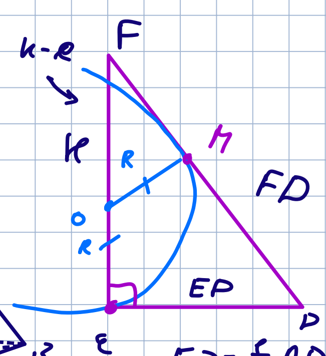
найти $R_{сф}$, вписанной в пирамиду
k, α





1) $\left.\begin{array}{l} BC \perp FD \\ BC \perp FE \end{array}\right\} \Rightarrow BC \perp (FDE)$

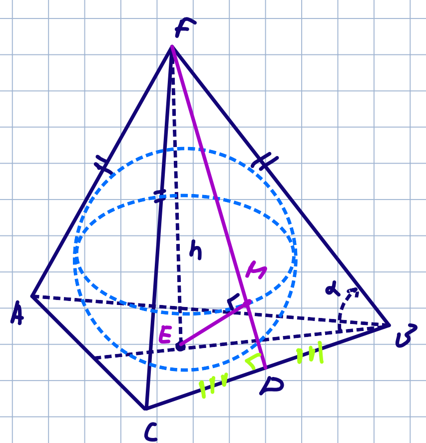




2) $ED = \frac{1}{3} AD = \frac{1}{3} BE' = \frac{1}{2} BE$

$BE = k \, ctg\,\alpha$

$ED = \frac{1}{2} k \, ctg\,\alpha$



3) $FD = \sqrt{ED^2 + k^2}$

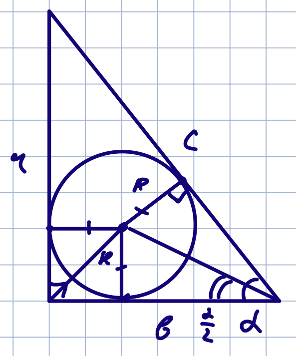
$FD = k\sqrt{\frac{1}{4} ctg^2\alpha + 1}$

$FD = \frac{1}{2} k\sqrt{ctg^2\alpha + 4}$

4) $\Delta FMO \sim \Delta FDE$

$K = \frac{R}{ED} = \frac{k-R}{FE} = \frac{FM}{FE}$

$FE \cdot R = (k-R) ED$



$x^2 + 6x + 6(x+6)$

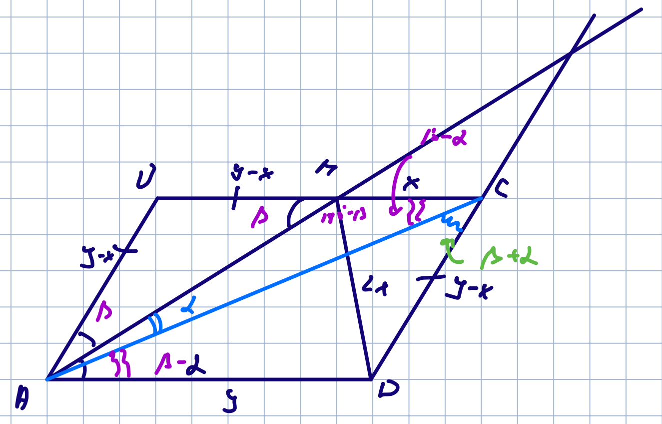
$x(x+6) + 6(x+6)$

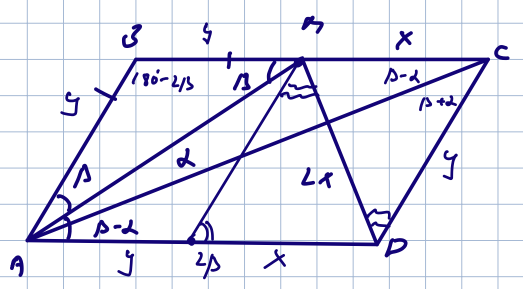
$(x+6)(x+6)$

$tg\,\alpha = \frac{BC}{AC}$

$tg\,\frac{\alpha}{2} = \frac{R}{B_2}$

$B_2 = \frac{R}{tg\,\frac{\alpha}{2}}$





$$x + 2y + xy + 1 = 0$$

$$y(2+x) = -(1+x)$$

$$y = -\frac{1+x}{2+x}$$