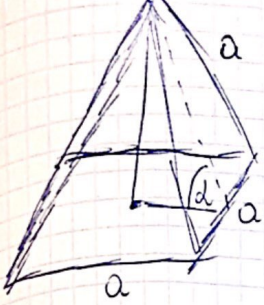
1.



$d = a\sqrt{2}$

$h^2 + \left(\frac{a\sqrt{2}}{2}\right)^2 = a^2$

$h^2 + \frac{2a^2}{4} = a^2$

$h^2 = \frac{4a^2}{4} - \frac{2a^2}{4}$

$h^2 = \frac{2a^2}{4} = \frac{a^2}{2}$

$h = \frac{a}{\sqrt{2}} = \frac{a\sqrt{2}}{2}$

$h^2 + \frac{a^2}{4} = a^2$

$h^2 = \frac{4a^2}{4} - \frac{a^2}{4}$

$h^2 = \frac{3a^2}{4} = \frac{a\sqrt{3}}{2}$

$\cos\alpha = \frac{\frac{a}{2}}{\frac{a\sqrt{3}}{2}} = \frac{a}{2} \cdot \frac{2}{a\sqrt{3}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$ (A)

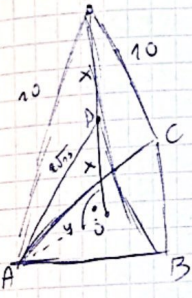
2.

$8^2 + 6^2 = d^2$

$d = 64 + 36$

$d = 10$ (D)

3.



$|AD| = 2\sqrt{13}$

$V = \frac{P_0 \cdot H}{3}$

$\begin{cases} y^2 + x^2 = (2\sqrt{13})^2 \\ (2x)^2 + y^2 = 10^2 \end{cases}$

$\begin{cases} y^2 + x^2 = 52 \\ 4x^2 + y^2 = 100 \end{cases}$ $\Rightarrow x^2 = 52 - y^2 \Rightarrow x^2 = 52 - 36$

$x^2 = 16$

$x = 4$

$4(52 - y^2) + y^2 = 100$

$208 - 4y^2 + y^2 = 100$

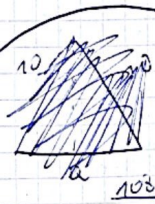
$-3y^2 = -108$

$y^2 = 36$

$y = 6$

$\begin{cases} x = 4 \\ y = 6 \end{cases}$

$H = 8$



$V = \frac{(6\sqrt{3})^2 \cdot \sqrt{3}}{4} \cdot \frac{8}{3} =$

$= \frac{108\sqrt{3} \cdot 8}{4} = \frac{216\sqrt{3}}{3} = 72\sqrt{3}$ (J)

$h = \frac{a\sqrt{3}}{2}$ $\frac{2h}{3} = y$

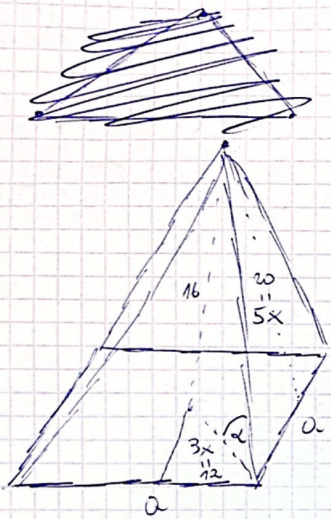
$\frac{2a\sqrt{3}}{2} = 6$

$\frac{a\sqrt{3}}{3} = 6 \quad /\cdot 3$

$a\sqrt{3} = 18$

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

4.



$\cos\alpha = \frac{3}{5}$

$(3x)^2 + 16^2 = (5x)^2$

$9x^2 + 256 = 25x^2$

$256 = 16x^2$

$x^2 = 16$

$x = 4$

$\left(\frac{a}{2}\right)^2 + \left(\frac{a}{2}\right)^2 = 12^2$

$\frac{a^2}{4} + \frac{a^2}{4} = 144 \quad /\cdot 4$

$20^2 = 576$

$a^2 = 288$

$a = \sqrt{288} = \sqrt{144 \cdot 2} = 12\sqrt{2}$

$h^2 + (6\sqrt{2})^2 = 20^2$

$h^2 + 72 = 400$

$h^2 = 328$

$h = \sqrt{328} = \sqrt{4 \cdot 82} = 2\sqrt{82}$

$P_\Delta = \frac{12\sqrt{2} \cdot 2\sqrt{82}}{2} = 6\sqrt{2} \cdot 2\sqrt{82} =$

$= 12\sqrt{164} =$

$= 24\sqrt{41}$

$P_b = 4 \cdot P_\Delta = 4 \cdot 24\sqrt{41} = 96\sqrt{41}\ [j]^2$