$n\ 1-2+3-4+5-6+\ldots+(2n-1)-2n$

$-1 + -1 + -1 + \ldots + -1 = n\cdot(-1)$

15. $\frac{2}{3}a$

16. $V=\frac{a^3 \operatorname{tg}\alpha}{12}$, dla dyd $V=48\sqrt{3}$

17. $V=\frac{a^3}{24}(1+\sqrt{5})$

18. $V=\frac{a^3 \operatorname{tg}\alpha\sqrt{3}}{12}$

$P_c=\frac{a^2\sqrt{3}}{4}+a^2\operatorname{tg}\alpha+\frac{1}{4}a^2\sqrt{4\operatorname{tg}^2\alpha+3}$

19. $V=\frac{a^3\sin 2\alpha}{8}$

$P_c=\frac{a^2\sqrt{3}}{2}+a^2\cos\alpha\sqrt{12-9\cos^2\alpha}$

20a) $V=\frac{a^3\sqrt{2}}{6}\operatorname{tg}\alpha$

$P_c=a^2+a^2\sqrt{1+2\operatorname{tg}^2\alpha}$

21. $V=\frac{4\sqrt{6}}{3}$

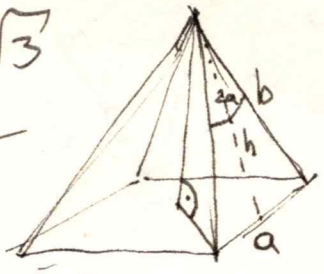
22. $V=\frac{b^3\cos^2\beta}{3}\sqrt{1-2\cos^2\beta}$

23. $\operatorname{tg}\alpha=\frac{\sqrt{6}}{3}$

$P_b=\frac{64}{12}\cdot\frac{8\sqrt{10^5}}{\sqrt{3}}=\frac{512\sqrt{15}}{3}$

24. $\left(\frac{\operatorname{tg}^2\alpha+2}{\operatorname{tg}\alpha\cdot\operatorname{tg}\frac{\alpha}{2}}\right)^3$

25.



$\sin\alpha=\frac{\frac{a}{2}}{b}$

$b=\frac{a}{2\sin\alpha}$

$\operatorname{ctg}\alpha=\frac{h}{\frac{a}{2}}$

$h=\frac{a}{2}\operatorname{ctg}\alpha$

$H^2+\frac{a^2}{2}=b^2$

$H^2=\frac{a^2}{4\sin^2\alpha}-\frac{2a^2\sin^2\alpha}{4\sin^2\alpha}$

$H=\frac{a}{2\sin\alpha}\sqrt{1-2\sin^2\alpha}$

$P=\frac{1}{2}ah=\frac{1}{4}a^2\operatorname{ctg}\alpha$

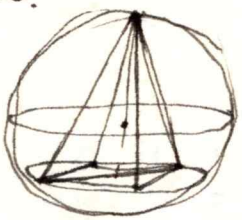
$a^2=4P\operatorname{tg}\alpha$

$a=2\sqrt{P\operatorname{tg}\alpha}$

$V=\frac{1}{3}a^2\cdot\frac{a}{2\sin\alpha}\sqrt{\cos 2\alpha}=\frac{a^3\sqrt{\cos 2\alpha}}{6\sin\alpha}=$

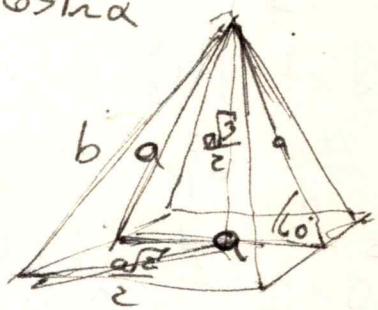
$=\frac{(2\sqrt{P\operatorname{tg}\alpha})^3\sqrt{\cos 2\alpha}}{6\sin\alpha}$

26.



$4\pi R^2=64\pi$

$R=4$



$b^2=\frac{2a^2}{4}+\frac{3a^2}{4}$

$b=\frac{a\sqrt{5}}{2}$

$\frac{1}{2}\cdot\frac{a\sqrt{3}}{2}\cdot a\sqrt{2}=\frac{\frac{a\sqrt{5}}{2}\cdot a\sqrt{2}}{4}$

$\frac{16\sqrt{3}}{5}=a$

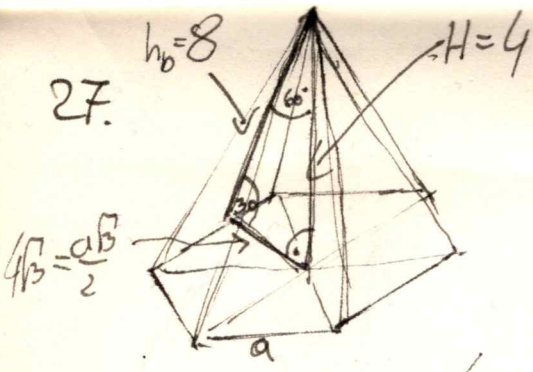
$V=\frac{1}{3}a^2\cdot\frac{a\sqrt{3}}{2}=\frac{a^3\sqrt{3}}{6}=$

$=\frac{16^3\cdot 3\cdot 3}{5^3\cdot 6}=\frac{6144}{125}$

$P_c=a^2+4\cdot\frac{1}{2}a\cdot a=3a^2=$

$=3\cdot\frac{256\cdot 3}{25}=\frac{2304}{25}$

27.



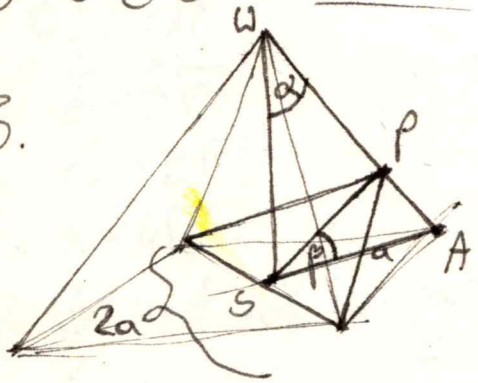
$$P_p = 6 \cdot \frac{a^2\sqrt{3}}{4} = 96\sqrt{3}$$

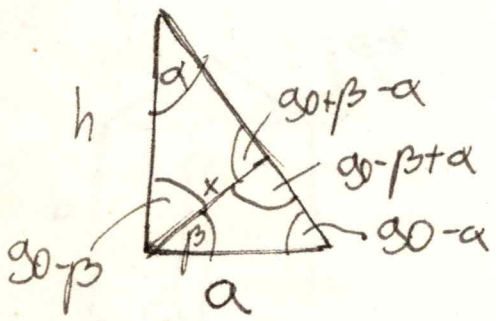
$$a = 8$$

$$V = \frac{1}{3} P_p \cdot H = \frac{1}{3} \cdot 96\sqrt{3} \cdot 4 = \underline{\underline{128\sqrt{3}}}$$

$$P_b = 6 \cdot \frac{1}{2} \cdot 8 \cdot 8 = \underline{\underline{192}}$$

28.





$$\frac{x}{\sin\alpha} = \frac{h}{\sin(90+\beta-\alpha)} \qquad \frac{a}{\sin(90-\beta+\alpha)} = \frac{x}{\sin(90-\alpha)}$$

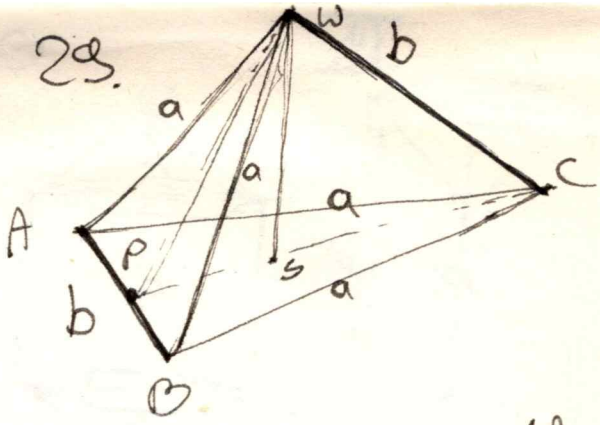
$$h = \frac{x\cos(\beta-\alpha)}{\sin\alpha} \qquad a = \frac{x\cos(\alpha-\beta)}{\cos\alpha}$$

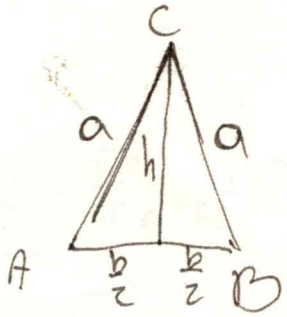
$$x = \frac{h\sin\alpha}{\cos(\beta-\alpha)}$$

$$P_{pc} = \frac{1}{2} \cdot 2a \cdot x = ax = \frac{x^2\cos(\alpha-\beta)}{\cos\alpha} = \frac{h^2\sin^2\alpha}{\cos^2(\beta-\alpha)} \cdot \frac{\cos(\alpha-\beta)}{\cos\alpha} =$$

$$= \underline{\underline{\frac{h^2\sin^2\alpha}{\cos(\beta-\alpha)\cos\alpha}}}$$

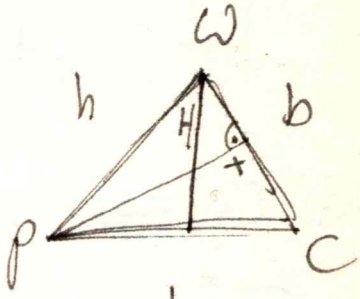
29.





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

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



$$x^2 = h^2 - \frac{b^2}{4}$$

$$x = \frac{\sqrt{4a^2-2b^2}}{2}$$

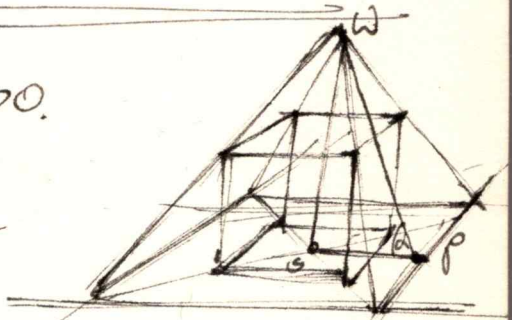
$$\frac{1}{2}H \cdot h = \frac{1}{2} x b$$

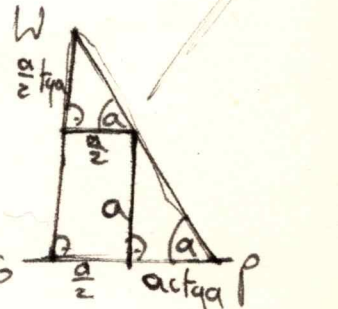
$$H = \frac{xb}{h}$$

$$V = \frac{1}{3} P_p \cdot H = \frac{1}{3} \cdot \frac{1}{2} \cdot h \cdot b \cdot \frac{xb}{h} = \frac{1}{6} x b^2 =$$

$$= \underline{\underline{\frac{b^2\sqrt{4a^2-2b^2}}{12}}}$$

30.

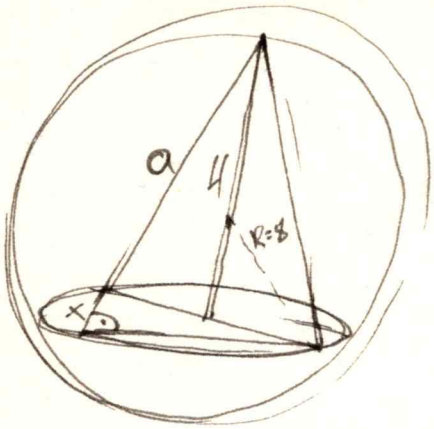




$$V = \frac{1}{3}\left(a + 2a\,\mathrm{ctg}\alpha\right)^2 \cdot \left(a + \frac{a}{2}\mathrm{tg}\alpha\right) =$$

$$= \underline{\underline{\frac{1}{3}a^3(1+2\,\mathrm{ctg}\alpha)^2(1+\frac{1}{2}\mathrm{tg}\alpha)}}$$

31.



$H = 12$

$\frac{a\sqrt{3}}{2} = 12$

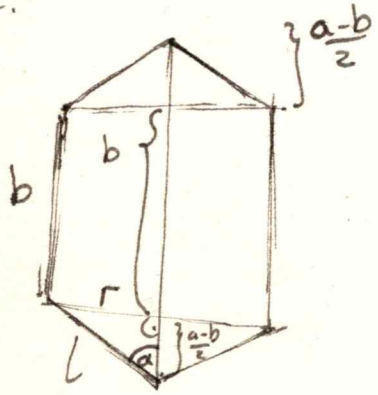
$a = 8\sqrt{3}$

$x\sqrt{2} = 8\sqrt{3}$

$x = 4\sqrt{6}$

$V = \frac{1}{3}x^2 \cdot H = \frac{1}{6} \cdot 16 \cdot 6 \cdot 12 = 192$

32.



$r = \frac{a-b}{2} \operatorname{tg} a$

$l = \frac{a-b}{2\cos a}$

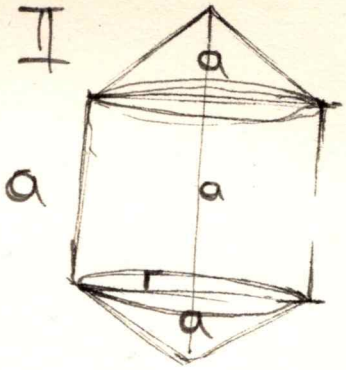
$V = \pi r^2 \cdot b + 2 \cdot \frac{1}{3}\pi r^2 \cdot \frac{a-b}{2} =$

$= \pi r^2 \left(b + \frac{1}{3} \cdot \frac{a-b}{2}\right) = \pi \frac{(a-b)^2}{4} \cdot \frac{2b+3a}{3} \operatorname{tg} a$

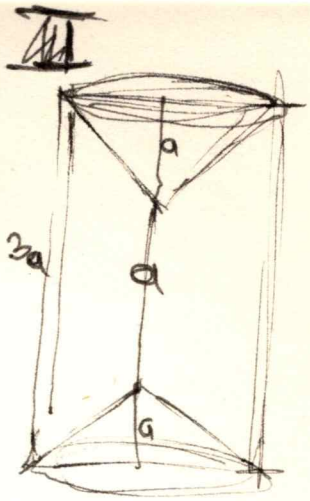
$P_c = 2\pi r l + 2\pi r b = 2\pi r (l+b) = \pi (a-b) \operatorname{tg} a \cdot \left(\frac{a-b}{2\cos a} + b\right)$

33.

II



III



$V_{II} = \pi r^2 \cdot a + 2 \cdot \frac{1}{3}\pi r^2 \cdot a$

$V_{II} = \frac{5}{3}\pi r^2 \cdot a$

$V_I = \pi r^2 \cdot 3a - 2 \cdot \frac{1}{3}\pi r^2$

$V_I = \frac{7}{3}\pi r^2 \cdot a$

$\frac{V_I}{V_{II}} = \frac{7}{5}$