

Geometry (H)
Warm up - Pyramids

Name: KPEY

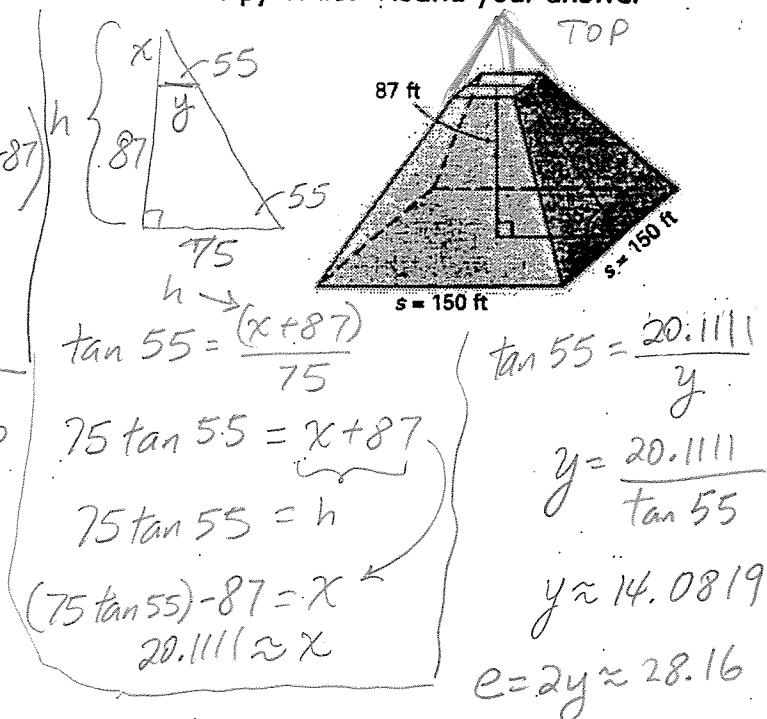
Suppose a regular pyramid has a square base with a 150 ft base edge. It is 87 ft tall and the angle of the slant is 55° . Find the total area and volume of the pyramid. Round your answer to the nearest tenth. \rightarrow use trig.

$$V = V_{wh} - V_{TOP}$$

$$\frac{1}{3}(150)^2(75 \tan 55) - \frac{1}{3}(28.16)^2(75 \tan 55 - 87)$$

$$803,333.2538 - 5315.9377$$

$$V = 798,017.3 \text{ cu. ft.}$$



$$TA = TA_{whole} - TA_{TOP} + B_{TOP}$$

(LA + B) (LA)

(continue on next page)

$$\tan 55 = \frac{(x+87)}{75}$$

$$75 \tan 55 = x + 87$$

$$75 \tan 55 = h$$

$$(75 \tan 55) - 87 = x$$

$$20.1111 \approx x$$

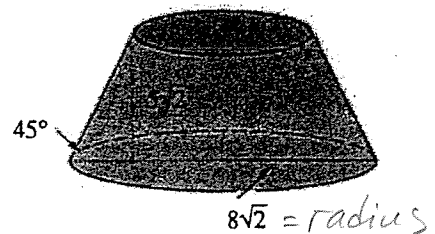
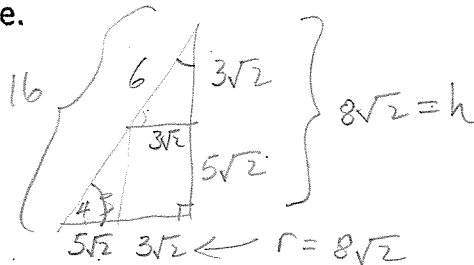
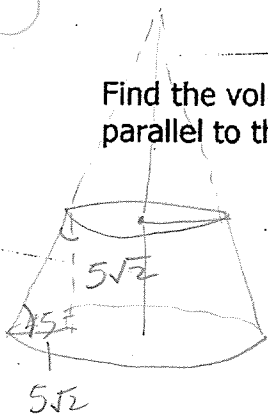
$$\tan 55 = \frac{20.1111}{y}$$

$$y = \frac{20.1111}{\tan 55}$$

$$y \approx 14.0819$$

$$e = 2y \approx 28.16$$

Find the volume and the total area of this solid formed by truncating a cone with a plane parallel to the base.



$$V_{whole} = \frac{1}{3} B h$$

$$= \frac{1}{3} (\pi (8\sqrt{2})^2) (8\sqrt{2})$$

$$= \frac{1024 \pi \sqrt{2}}{3}$$

$$V_{TOP} = \frac{1}{3} \pi (3\sqrt{2})^2 (3\sqrt{2})$$

$$6\pi (3\sqrt{2})$$

$$18\pi \sqrt{2}$$

$$V = \frac{970 \pi \sqrt{2}}{3}$$

$$TA = (LA_{whole} - LA_{TOP}) + A_{TOP} + A_{BOTTOM}$$

$$= \pi r l - \pi r_{TOP} l + \pi r_{TOP}^2 + \pi r^2$$

$$= \pi (8\sqrt{2})(16) - \pi (3\sqrt{2})(6) + \pi (3\sqrt{2})^2 + \pi (8\sqrt{2})^2$$

$$= 128 \pi \sqrt{2} - 18 \pi \sqrt{2} + 18 \pi + 128 \pi$$

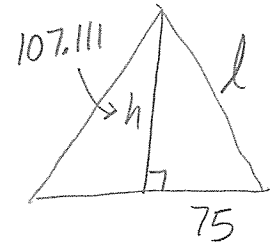
$$TA = 110 \pi \sqrt{2} + 146 \pi$$

Pyramid

$$\begin{aligned} TA &= TA_{\text{whole}} - TA_{\text{TOP}} + B_{\text{TOP}} \\ &= LA + B_{\text{BOTTOM}} - LA + B_{\text{TOP}} \\ &= \frac{1}{2}pl + e^2 - \frac{1}{2}pl + e^2 \\ &= \frac{1}{2}(600)(130.759) + 22,500 - \frac{1}{2}(112.6556)(24.5511) \\ &\quad + 28.16^2 \end{aligned}$$

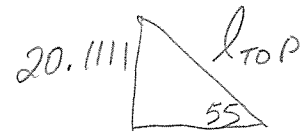
$$TA = 61,137.78$$

Slant ht



$$\begin{aligned} (107.111)^2 + 75^2 &= l^2 \\ 130.759 &= l \end{aligned}$$

TOP Pyramid sl. ht.



$$\begin{aligned} \sin 55 &= \frac{20.1111}{l} \\ l &\approx 24.5511 \end{aligned}$$

You can also find TA
by finding Area of a trapezoid
times 4 and add the 2 bases.