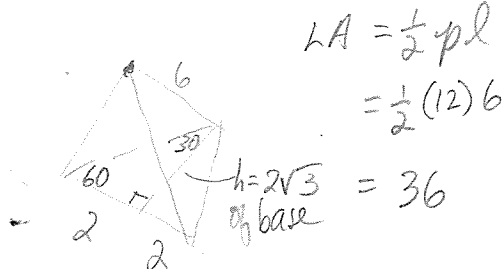


slant height  $\neq$  lateral edge Notes

1. Find the LA, TA and V of each pyramid described.

a. A regular triangular pyramid with base edge 4 and slant height 6.



$$LA = \frac{1}{2} pl$$

$$= \frac{1}{2} (12) 6$$

$$= 36$$

$$TA = LA + B$$

$$= 36 + \frac{1}{2} bh$$

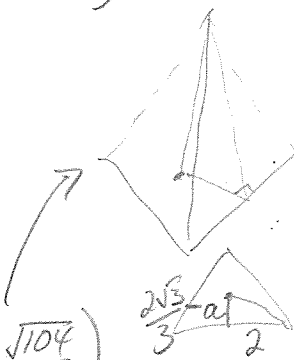
$$= \frac{1}{2} (4) (2\sqrt{3})$$

$$= 36 + 4\sqrt{3}$$

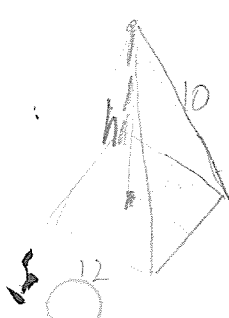
$$V = \frac{1}{3} Bh$$

$$= \frac{1}{3} (4\sqrt{3}) \left( \frac{\sqrt{104}}{\sqrt{3}} \right)$$

$$= \frac{4}{3} \sqrt{104} = \frac{4}{3} (2) \sqrt{26} = \frac{8\sqrt{26}}{3}$$



b. A regular square pyramid with base edge 12 and lateral edge 10.

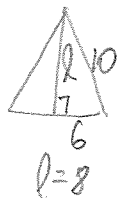


$$B = 144$$

$$LA = \frac{1}{2} pl$$

$$= \frac{1}{2} (48) 8$$

$$= 192$$



$$TA = LA + B$$

$$= 192 + 144$$

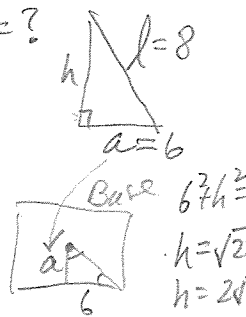
$$= 336$$

$$V = \frac{1}{3} Bh$$

$$= \frac{1}{3} (144) 2\sqrt{7}$$

$$= 48 (2\sqrt{7})$$

$$= 96\sqrt{7}$$



2. A regular octagonal pyramid has base edge 3 m and lateral area  $60 \text{ m}^2$ . Find its slant height. (l)

$$B = \frac{1}{2} ap$$

$$= \frac{1}{2} (3.6213) (24)$$

$$= 43.4558$$

$$LA = \frac{1}{2} pl$$

$$60 = \frac{1}{2} (24) l$$

$$5 = l$$

$$TA = LA + B$$

$$= 60 + 43.4558$$

$$TA = 103.4558$$

$$V = \frac{1}{3} Bh \rightarrow h$$

$$= \frac{1}{3} (43.4558) h$$

$$V = 329.5$$

Find the volume of the regular square pyramid. Round the answer to the nearest tenth.

$$B = 10^2 = 100$$

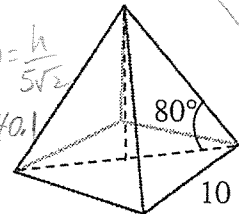
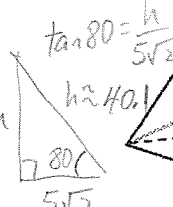
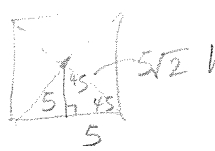
$$V = \frac{1}{3} Bh$$

$$= \frac{1}{3} (100) (40.1)$$

$$\approx 1336.66 \rightarrow 1336.7$$

> Need radius

Base



$$h = 25 - 1.5^2$$

$$h = 22.75$$

4. The base of a pyramid is a regular hexagon with sides  $y \text{ cm}$  long. The lateral edges are  $2y \text{ cm}$  long. Find the volume of the pyramid in terms of  $y$ .

$$6y = \text{perimeter}$$

$$\frac{y\sqrt{3}}{2} = \text{apothem}$$

$$y = \text{radius}$$

$$B = \frac{1}{2} \frac{y\sqrt{3}}{2} 6y$$

$$B = \frac{3y^2\sqrt{3}}{2}$$

Figure you need

Find h



$$V = \frac{1}{3} Bh$$

$$B = \frac{1}{2} ap$$

$$h^2 + y^2 = (2y)^2$$

$$h^2 = 4y^2 - y^2$$

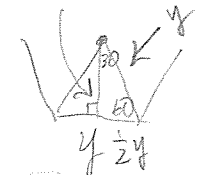
$$h^2 = 3y^2$$

$$V = \frac{1}{3} \frac{3y^2\sqrt{3}}{2} y\sqrt{3}$$

$$= \frac{3y^3}{2}$$

$$\rightarrow h = y\sqrt{3}$$

$$a = \frac{1}{2} y\sqrt{3}$$



$$LA = \pi r l$$

$$TA = LA + B \quad \leftarrow B = \pi r^2$$

$$V = \frac{1}{3} B h$$

Geometry (H)  
Section - Cones

$$A_1 = \frac{1}{2} (12)(14)$$

$$= 84$$

1. Find the volume and the total area of the semicircular cone.

$$TA = LA + B$$

$$= \pi r l + \pi r^2$$

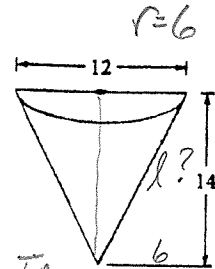
$$= 6\pi(2\sqrt{58}) + \pi 36$$

$$\frac{1}{2} (12\pi\sqrt{58} + 36\pi)$$

$$V = \frac{1}{3} B h$$

$$= \frac{1}{3} 36\pi (14) (\frac{1}{2})$$

$$= \boxed{84\pi}$$



$$6^2 + 14^2 = l^2$$

$$232 = l^2$$

$$2\sqrt{58} = l$$

2. Find the volume remaining if the smaller cone is removed from the larger.

$$V_{\text{remain}} = V_{Lg} - V_{sm}$$

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

$$= \frac{1}{3} \pi 6^2 (4)$$

$$= 48\pi$$

$$V_{Lg} = \frac{1}{3} 36\pi (10)$$

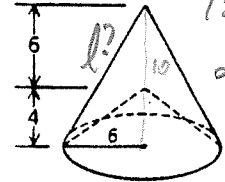
$$= 120\pi$$

not needed

$$6^2 + 10^2 = l^2$$

$$136 = l^2$$

$$2\sqrt{34} = l$$



$$120\pi - 48\pi = V_{\text{remain}}$$

$$\boxed{72\pi} = V$$

3. The total height of the tower shown is 10 m. If one liter of paint will cover an area of 10 m<sup>2</sup>, how many 1 liter cans of paint are needed to paint the entire tower?

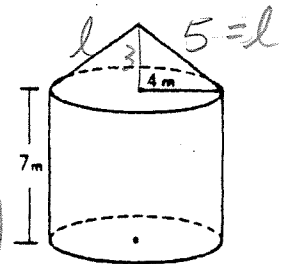
$$TA_{\text{tower}} = LA_{\text{cyl}} + B_{\text{cyl}} + LA_{\text{cone}}$$

$$= 2\pi r h + \pi r^2 + \pi r l$$

$$= 8\pi(7) + \pi 16 + \pi 4(5)$$

$$= \boxed{92\pi \text{ sq.}}$$

$$\frac{92(3.14)}{10} = \approx \frac{289}{10} \approx \boxed{29 \text{ Cans}}$$



4. Find the volume and total area of the truncated cone.

$$TA_{\text{truncated}} = TA_w - TA_{\text{cut}} + B_w + B_{\text{cut}}$$

$$= \pi 9(15) - \pi 6(10) + \pi 9^2 + \pi 6^2$$

$$= 75\pi + 117\pi = \boxed{192\pi}$$

$$\frac{6}{9} = \frac{x}{x+5}$$

$$6x + 30 = 9x$$

$$30 = 3x$$

$$10 = x$$

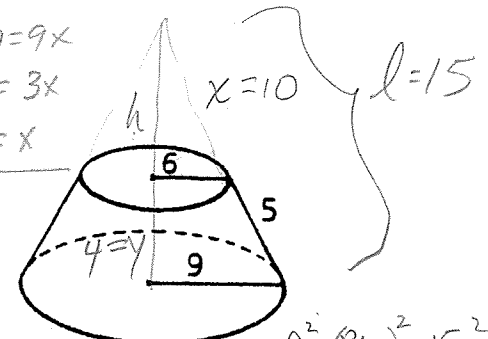
$$V_{\text{trunc.}} = V_w - V_{\text{cut}}$$

$$= \frac{1}{3} 81\pi(12) - \frac{1}{3} 36\pi(8)$$

$$= 324\pi - 96\pi = \boxed{228\pi \text{ cubic}}$$

$$h_{\text{cut}} = 8$$

$$h_w = 12$$



$$(y+20)(y-4) = 0$$

$$L20 \quad y=4$$

$$9^2 + (8+y)^2 = 15^2$$

$$y^2 + 16y + 64 = 144$$