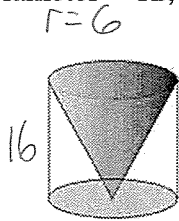


Geometry (H)  
More Area & Volume problems

KEY

1. Find the volume and total area of the cylinder with the cone removed.  
Diameter = 12, height = 16



$$V = \pi r^2 h - \frac{1}{3} \pi r^2 h$$

$$= \pi 36(16) - \frac{1}{3} \pi 36(16)$$

$$= 576\pi - 192\pi$$

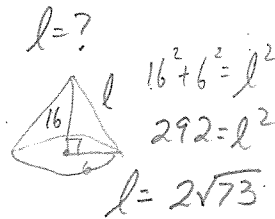
$$V = 384\pi$$

$$TA = \text{Base} + LA_{\text{cylinder}} + \text{Cone}$$

$$= \pi 6^2 + 2\pi(6)16 + \pi(6)(2\sqrt{73})$$

$$= 36\pi + 192\pi + 12\sqrt{73}\pi$$

$$= 228\pi + 12\pi\sqrt{73}$$



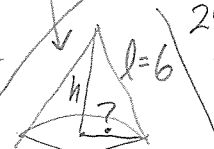
2. A 240° sector is cut out of a circular paper with radius 6 in. and bent to form the lateral surface of a cone. What is the volume of the cone?

$V = \frac{1}{3} \pi r^2 h$  ← need r of base  
need h.



$$\frac{240}{360} \pi 6^2 = L.A_{\text{cone}}$$

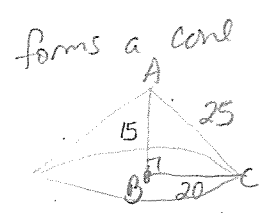
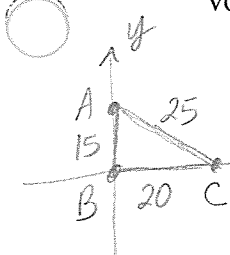
$$24\pi = L.A_{\text{cone}}$$



$LA = \pi r l$   
 $24\pi = \pi r(6)$   
 $4 = r$

$h^2 + 4^2 = 6^2$   
 $h = 2\sqrt{5}$   
 $V = \frac{1}{3} \pi 4^2 (2\sqrt{5})$   
 $V = \frac{32\pi\sqrt{5}}{3}$

3. In  $\triangle ABC$ ,  $AB = 15$ ,  $AC = 25$  and  $BC = 20$ . The triangle is rotated about leg  $AB$ . Find the volume of the resulting solid.

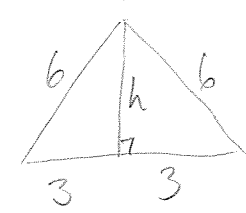


$V = \frac{1}{3} B h$   
 $= \frac{1}{3} \pi r^2 h$   
 $= \frac{1}{3} \pi 20^2 (15)$

$$= \frac{6000\pi}{3}$$

$$V = 2000\pi$$

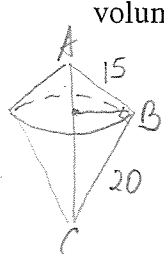
4. An equilateral triangle with 6 cm side lengths is rotated about an altitude. Find the volume of the resulting solid.



Cone →  $V = \frac{1}{3} B h$   
 $h^2 + 3^2 = 6^2$   
 $h^2 = 36 - 9 = 27$   
 $h = 3\sqrt{3}$   
 $\frac{1}{3} \pi r^2 h$   
 $\frac{1}{3} \pi 9(3\sqrt{3}) = 9\sqrt{3}\pi$

$$V = 9\pi\sqrt{3}$$

5. In  $\triangle ABC$ ,  $AB = 15$ ,  $AC = 25$  and  $BC = 20$ . The triangle is rotated about leg  $AC$ . Find the volume of the resulting solid.



geometric mean:  
 $\frac{15}{x} = \frac{25}{15}$   
 $25x = 225$   
 $h = x = 9$   
 $\frac{r}{9} = \frac{16}{r}$   
 $r^2 = 144$   
 $r = 12$   
radius = 12

$V_{\text{TOP}} = \frac{1}{3} \pi 12^2 (9)$   
 $= 432\pi$

$V_{\text{BOTTOM}} = \frac{1}{3} \pi 12^2 (16)$   
 $= 768\pi$

ht. ↓  
 $V = \frac{1}{3} \pi 12^2 (25)$   
 $V = 1200\pi$

$$V_{\text{SOLID}} = 1200\pi$$