

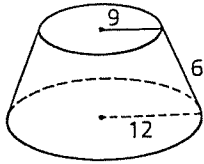


Name \_\_\_\_\_

*Frustum Homework – Geometry (H)*

For each given frustum, find the total surface area and the volume. Show all work. Be neat and organized.

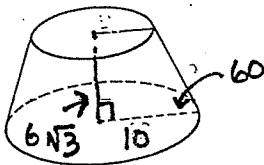
1.



Total Surface Area: \_\_\_\_\_

Volume: \_\_\_\_\_

2.

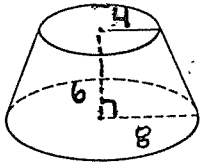


Total Surface Area: \_\_\_\_\_

Volume: \_\_\_\_\_



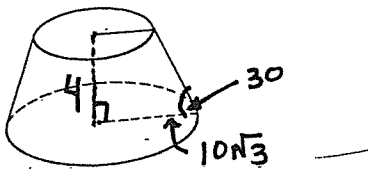
3.



Total Surface Area: \_\_\_\_\_

Volume: \_\_\_\_\_

4.



Total Surface Area: \_\_\_\_\_

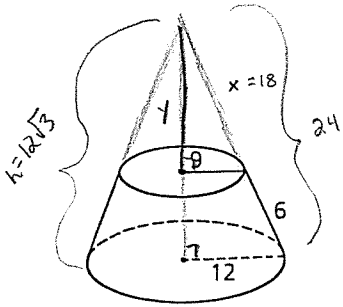
Volume: \_\_\_\_\_



Name \_\_\_\_\_  
**Frustum Homework - Geometry (H)**

For each given frustum, find the total surface area and the volume. Show all work. Be neat and organized.

1.  $SA_{\text{frustum}} = SA_{\text{lg cone}} - LA_{\text{sm cone}} + B_{\text{sm cone}}$   
 $= \frac{1}{2} \cdot 2\pi(12) \cdot (24) + \pi(12)^2 - \frac{1}{2} \cdot 2\pi(9) \cdot (18) + \pi(9)^2$   
 $= 288\pi + 144\pi - 162\pi + 81\pi$   
 $= 351\pi$



$$\frac{x}{x+6} = \frac{9}{12}$$

$$12x = 9x + 54$$

$$3x = 54$$

$$x = 18$$

$$y^2 + 9^2 = 18^2$$

$$y^2 = 18^2 - 9^2$$

$$y = \sqrt{243}$$

$$y = 9\sqrt{3}$$

$$h^2 + 12^2 = 24^2$$

$$h^2 = 24^2 - 12^2$$

$$h = \sqrt{432}$$

$$h = 12\sqrt{3}$$

$$V_{\text{frustum}} = V_{\text{lg cone}} - V_{\text{sm cone}}$$

$$V_{\text{frustum}} = \frac{1}{3} \cdot \pi(12)^2 \cdot (12\sqrt{3}) - \frac{1}{3} \cdot \pi(9)^2 \cdot (9\sqrt{3})$$

$$= 576\pi\sqrt{3} - 243\pi\sqrt{3}$$

$$= 333\pi\sqrt{3}$$

Total Surface Area: 351π u<sup>2</sup>

Volume: 333π√3 u<sup>3</sup>

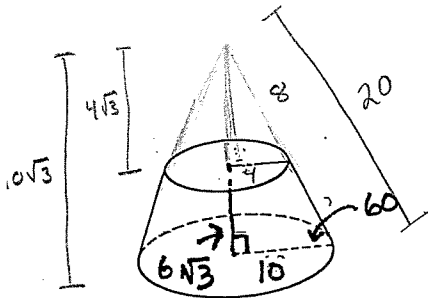
2.

$$SA_{\text{frustum}} = SA_{\text{lg cone}} - LA_{\text{sm cone}} + B_{\text{sm cone}}$$

$$= \frac{1}{2} \cdot 2\pi(10) \cdot (20) + \pi(10)^2 - \frac{1}{2} \cdot 2\pi(4) \cdot (8) + \pi(4)^2$$

$$= 200\pi + 100\pi - 32\pi + 16\pi$$

$$= 284\pi$$



$$V_{\text{frustum}} = V_{\text{lg cone}} - V_{\text{sm cone}}$$

$$= \frac{1}{3} \cdot \pi(10)^2 \cdot (10\sqrt{3}) - \frac{1}{3} \cdot \pi(4)^2 \cdot (4\sqrt{3})$$

$$= \frac{1000\pi\sqrt{3}}{3} - \frac{64\pi\sqrt{3}}{3} = \frac{936\pi\sqrt{3}}{3} = 312\pi\sqrt{3}$$

Total Surface Area: 284π u<sup>2</sup>

Volume: 312π√3 u<sup>3</sup>



3.

$$\frac{x}{x+6} = \frac{4}{8}$$

$$8x = 4x + 24$$

$$4x = 24$$

$$x = 6$$

$$y^2 = 6^2 + 4^2$$

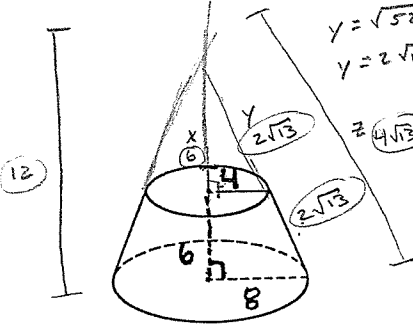
$$y = \sqrt{52}$$

$$y = 2\sqrt{13}$$

$$z^2 = 8^2 + 12^2$$

$$z = \sqrt{208}$$

$$z = 4\sqrt{13}$$



$$SA_{\text{frustum}} = SA_{\text{lg cone}} - LA_{\text{sm cone}} + B_{\text{sm cone}}$$

$$= \frac{1}{2} \cdot 2\pi(8) \cdot (4\sqrt{13}) + \pi(8)^2 - \frac{1}{2} \cdot 2\pi(4)(2\sqrt{13}) + \pi(4)^2$$

$$= 32\pi\sqrt{13} + 64\pi - 8\pi\sqrt{13} + 16\pi$$

$$= 24\pi\sqrt{13} + 80\pi$$

$$V_{\text{frustum}} = V_{\text{lg cone}} - V_{\text{sm cone}}$$

$$= \frac{1}{3} \cdot \pi(8)^2 \cdot (12) - \frac{1}{3} \cdot \pi(4)^2(6)$$

$$= 256\pi - 32\pi$$

$$= 224\pi$$

Total Surface Area:  $(24\pi\sqrt{13} + 80\pi) u^2$

Volume:  $224\pi u^3$

4.

$$SA_{\text{frustum}} = SA_{\text{lg cone}} - LA_{\text{sm cone}} + B_{\text{sm cone}}$$

$$= \frac{1}{2} \cdot 2\pi(10\sqrt{3})(20) + \pi(10\sqrt{3})^2 - \frac{1}{2} \cdot 2\pi(6\sqrt{3})(12) + \pi(6\sqrt{3})^2$$

$$= 200\pi\sqrt{3} + 300\pi - 72\pi\sqrt{3} + 108\pi$$

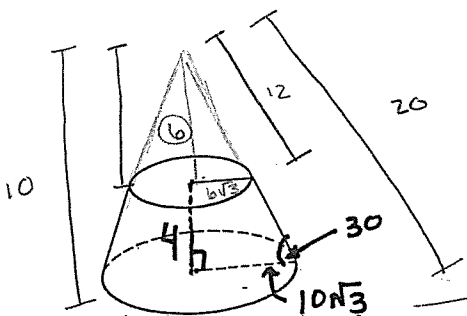
$$= 128\pi\sqrt{3} + 408\pi$$

$$V_{\text{frustum}} = V_{\text{lg cone}} - V_{\text{sm cone}}$$

$$= \frac{1}{3} \cdot \pi(10\sqrt{3})^2 \cdot 10 - \frac{1}{3} \cdot \pi(6\sqrt{3})^2 \cdot 6$$

$$= 1000\pi - 216\pi$$

$$= 784\pi$$



Total Surface Area:  $(128\pi\sqrt{3} + 408\pi) u^2$

Volume:  $784\pi u^3$