

Volume of Cones



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Key Concept

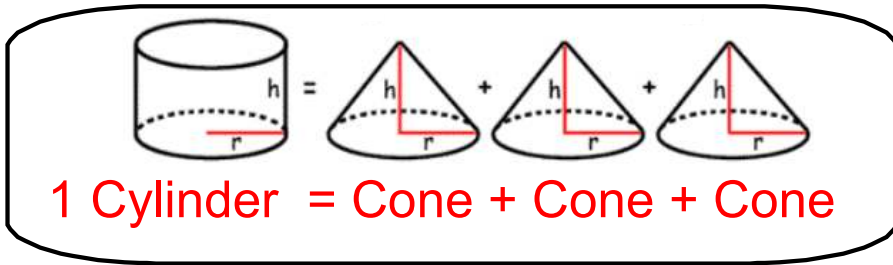
Volume of a Cone

Words The volume V of a cone with radius r is one third the area of the base B times the height h .

Symbol $V = \frac{1}{3}Bh$ or $V = \frac{1}{3}\pi r^2 h$

Model





$V = Bh$
 $V = \pi r^2 h$
 $V = \pi \cdot 3^2 \cdot 4$
 $V = 36\pi$

Pull here

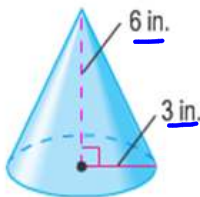
$V = \frac{1}{3}\pi r^2 h$
 $V = \frac{1}{3} \cdot \pi \cdot 3^2 \cdot 4$
 $V = 12\pi$

$V = 12\pi + V = 12\pi + V = 12\pi$

$36\pi = 12\pi + 12\pi + 12\pi$

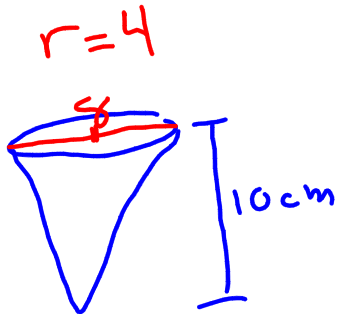
Model Problems:

- 1) Find the volume of the cone. Round to the nearest tenths place.



$V = \frac{1}{3}\pi r^2 h$
 $V = \frac{1}{3} \cdot \pi \cdot 3^2 \cdot 6$
 $V = 56.548$
 $V \approx 56.5 \text{ in}^3$

- 2) A cone-shaped paper cup is filled with water. The height of the cup is 10 centimeters and the diameter is 8 centimeters. What is the exact volume of the paper cup? (write your answer in terms of Pi)



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

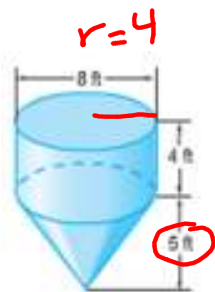
$$V = \frac{1}{3} \cdot \pi \cdot 4^2 \cdot 10$$

$$V = \frac{160}{3} \pi \text{ cm}^3$$

$$V = 53.\bar{3} \pi \text{ cm}^3$$

$$53\frac{1}{3} \pi \text{ cm}^3$$

- 3) Find the volume of the composite shape. Round your answer to the nearest tenths place.



$$V_{\text{total}} = V_{\text{cyl}} + V_{\text{cone}}$$

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

$$V = \pi \cdot 4^2 \cdot 4 + \frac{1}{3} \cdot \pi \cdot 4^2 \cdot 5$$

$$V \approx 201.0619 + 83.7758$$

$$V \approx 284.8377$$

$$V \approx 284.8 \text{ ft}^3$$

- 4) Find the exact volume of the shape. (write your answer in terms of Pi)

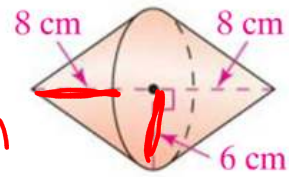
$$V = V_{\Delta} + V_{O}$$

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

$$V = \frac{1}{3} \pi \cdot 6^2 \cdot 8 + \frac{1}{3} \pi \cdot 6^2 \cdot 8$$

$$V = 96\pi + 96\pi$$

$$V = 192\pi \text{ cm}^3$$



Independent practice is to do 1-8 on the worksheet from my website. Work on your own sheet of paper (Do Not Print). Start with the odd questions.