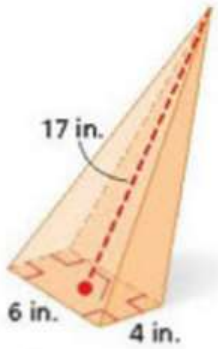
Day 3 Volume of Pyramids and Cones HW
pg. 761: 2-3, 6-7, 9-10, 16, 19, 34, 38, 41, 44

Find the volume of each pyramid. Round to the nearest tenth, if necessary.

2.

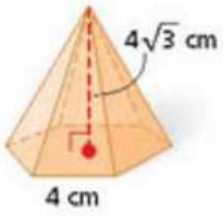


$V = \frac{A_{Base} \cdot h}{3}$

$= \frac{(6 \cdot 4) \cdot 17}{3}$

$V = 136 \text{ in}^3$

3.



$V = \frac{A_{Base} \cdot h}{3}$

$= \frac{24\sqrt{3} \cdot 4\sqrt{3}}{3}$

$= \frac{96 \cdot 3}{3}$

$V = 96 \text{ cm}^3$

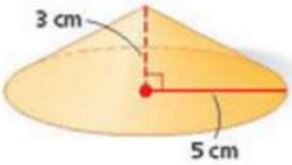
$A_{Base} = \frac{a \cdot p}{2}$

$= \frac{2\sqrt{3}(4 \cdot 6)}{2}$

$= 24\sqrt{3}$

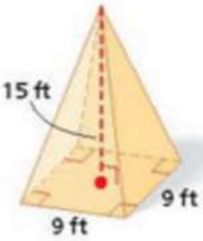
Describe the effect of each change on the volume of the given figure.

9. The dimensions are tripled.



If all dimensions are tripled, then the volume will be mult by 3x3x3 or 27

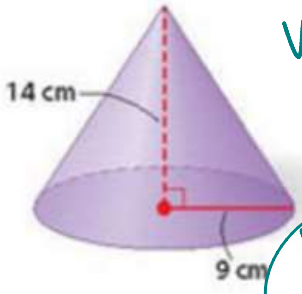
10. The dimensions are multiplied by $\frac{1}{2}$.



If all dimensions are tripled, then the volume will be mult. by $\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$ or $\frac{1}{8}$

Find the volume of each cone. Give your answers both in terms of π and rounded to the nearest tenth.

6.



$V = \frac{A_{Base} \cdot h}{3}$

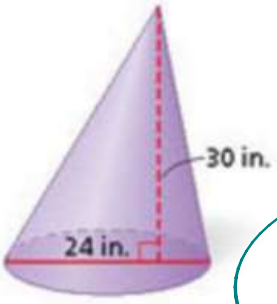
$= \frac{\pi(9)^2 \cdot 14}{3}$

$V = 378\pi \text{ cm}^3$

or

$V \approx 1,187.5 \text{ cm}^3$

7.



$V = \frac{A_{Base} \cdot h}{3}$

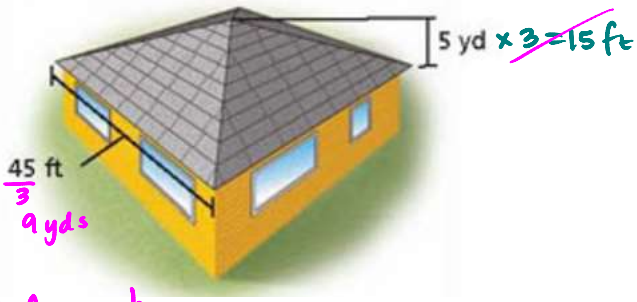
$= \frac{\pi(12)^2 \cdot 30}{3}$

$V = 1,440\pi \text{ in}^3$

or

$V \approx 4,523.9 \text{ in}^3$

16. Carpentry A roof that encloses an attic is a square pyramid with a base edge length of 45 feet and a height of 5 yards. What is the volume of the attic in cubic feet? In cubic yards?



* 1 yard = 3 feet *

$V = \frac{A_{Base} \cdot h}{3}$

$= \frac{(45 \cdot 45) \cdot 15}{3}$

$V = 10,125 \text{ ft}^3$

or

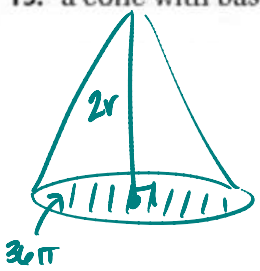
$V = \frac{A_{Base} \cdot h}{3}$

$= \frac{(9 \cdot 9) \cdot 5}{3}$

$= 135 \text{ yd}^3$

* This is why units are so important. Huge difference in numerical value, but $10,125 \text{ ft}^3$ is equivalent to 135 yd^3.

19. a cone with base area 36π ft^2 and a height equal to twice the radius



$A_{Base} = \pi r^2$

$36\pi = \pi r^2$

$6 = r$

so $h = 12$

$V = \frac{A_{Base} \cdot h}{3}$

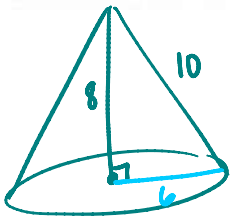
$= \frac{36\pi \cdot 12}{3}$

$V = 144\pi$ ft^3

or

$V \approx 452.4$ ft^3

34. Find the volume of a cone with slant height 10 ft and height 8 ft.



$V = \frac{A_{Base} \cdot h}{3}$

$= \frac{\pi(6)^2 \cdot 8}{3}$

$V = 96\pi$ ft^3 or $V \approx 301.6$ ft^3

38. ERROR ANALYSIS Which volume is incorrect? Explain the error.

A

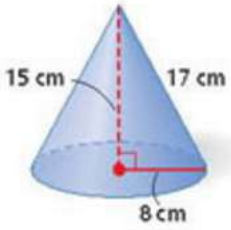
$V = \frac{1}{3}(8^2\pi)(17)$

$= \frac{1088\pi}{3}$ cm^3

B

$V = \frac{1}{3}(8^2\pi)(15)$

$= 320\pi$ cm^3



Volume A is in correct, because the formula for the volume of a cone is $V = \frac{A_{Base} \cdot h}{3}$ where h represents the height of the cone (not the slant height). Volume A uses 17, which is the slant height, instead of the actual height, which is 15.

MULTI-STEP TEST PREP

41. A juice stand sells smoothies in cone-shaped cups that are 8 in. tall. The regular size has a 4 in. diameter. The jumbo size has an 8 in. diameter.

a. Find the volume of the regular size to the nearest tenth.

b. Find the volume of the jumbo size to the nearest tenth.

c. The regular size costs $1.25. What would be a reasonable price for the jumbo size? Explain your reasoning.

$V_{Reg} = \frac{A_{Base} \cdot h}{3}$

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

$= 32\pi/3$ or ≈ 33.5 in^3

$V_{Jumbo} = \frac{A_{Base} \cdot h}{3}$

$= \frac{\pi(4)^2 \cdot 8}{3}$

$= \frac{128\pi}{3}$ or ≈ 134.0 in^3

The volume of the jumbo is 4 times the volume of the regular so a reasonable price for the jumbo would be 4 * 1.25 or $5

44. A cone has a volume of 18π in^3. Which are possible dimensions of the cone?

~~A~~ Diameter 1 in., height 18 in.

B Diameter 6 in., height 6 in.

~~C~~ Diameter 3 in., height 6 in.

~~D~~ Diameter 6 in., height 3 in.

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

$\frac{\pi 3^2 \cdot 3}{3}$

$V = \frac{A_{Base} \cdot h}{3}$