Module 13	Perimeter, Area, and Volume
Lesson 7	Volume: Pyramids and Cones



Set 1

Explain how you can find the radius of a cone with a volume of 942 cubic inches and a height of nine inches.



Explain what happens to a cone's volume when its radius is doubled but its height remains the same.



Explain what happens to a cone's volume when its height is doubled but its radius remains the same.

Set 2

Create a square pyramid with the same height and volume as the rectangular pyramid shown here. Explain how you created it.





Luria is designing storage areas for her out-of-season clothing. Which design has greater volume, A or B? How much greater?



NAME

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Possible Answers

Set 1

1. In the volume formula, substitute 3.14 for π , 942 cubic inches for the volume, and nine inches for the height.

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

942 in.³ = $\frac{1}{3} \times 3.14 \times r^{2} \times 9$ in.
942 in.³ = 9.42 in.× r^{2}
942 in.³ = r^{2}
100 in.² = r^{2}
10 in. ≈ r

The radius is approximately 10 inches.

2. The volume is quadrupled.

$$\frac{r}{V} = \frac{1}{3}\pi r^2 h \qquad \frac{2r}{V} = \frac{1}{3}\pi (2r)^2 h$$
$$= \frac{1}{3}\pi \times 4r^2 h$$
$$= 4 \times \left(\frac{1}{3}\pi r^2 h\right)$$

3. The volume is doubled.

$$\frac{h}{V} = \frac{1}{3}\pi r^2 h \qquad \frac{2h}{V} = \frac{1}{3}\pi r^2 (2h)$$
$$= 2 \times \left(\frac{1}{3}\pi r^2 h\right)$$



The area of the base is 64 square feet. To find the side length of the square base take the square root of 64. The side length of the square base is eight feet.

A: $V = \frac{1}{3}Bh$ $= \frac{1}{3}(15 \text{ ft})^{2} \times 20 \text{ ft}$ $= 1,500 \text{ ft}^{3}$ B: $V = \frac{1}{3}Bh$ $= \frac{1}{3}(20 \text{ ft} \times 10 \text{ ft}) \times 18 \text{ ft}$ $= 1,200 \text{ ft}^{3}$

1,500 ft³ - 1,200 ft³ = 300 ft³ Pyramid A has 300 ft³ more volume.

2.