

11.6 3/30/15

## Proportional Volumes Conjecture

\* IF two corresponding side lengths of two similar polyhedrons, or the radii of two spheres compare in the ratio

$$\frac{x}{y} = r \quad \text{or} \quad x : y = r$$

then their volumes compare in the ratio

$$\frac{x^3}{y^3} = r^3 \quad \left(\text{side ratio}\right)^3 = \text{Volume Ratio}$$

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How can you tell if these cones are similar?



$H = 14\text{cm}$   
 $r = 8\text{cm}$



$H = 21\text{cm}$   
 $r = 12\text{cm}$

if side length ratios are  
 $2:3$ ,

what are the area ratios?

$$(2:3)^2 \quad 4:9$$

What are the volume ratios?

$$(2:3)^3 \quad 8:27$$

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Two spheres have a radii ratio  
of  $1:3$ .

The larger sphere has a volume  
 $V = 2700 \text{ cm}^3$ .

What is the volume of the small sphere

$$\left(\frac{1}{3}\right)^3 \frac{x}{2700} = \frac{1}{27} = \frac{x}{2700} \quad x=100$$

AW 618: 1-6, 10-12