Name:_____Per:__ **11-7 Area and Volume of Similar Solids**

Warm-up

Are the figures similar? Explain. Include the similarity ratio as appropriate.

1. two squares, one with 3-in. sides and the other with 1-in. sides

2. two isosceles right triangles, one with a 3-cm hypotenuse and the other with a 1-cm leg

Find the volume of each space figure.

3. a cube with a 3-in. edge

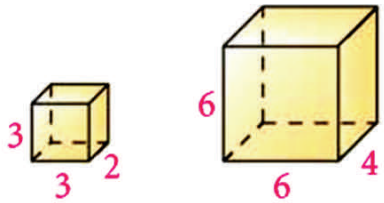
4. a 3 m-by-5 m-by-9 m rectangular prism

5. a cylinder with radius 4 cm and height 8 cm

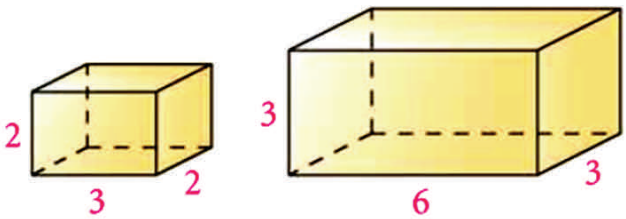
Notes:

Are the two rectangular prisms similar? If so, give the similarity ratio.

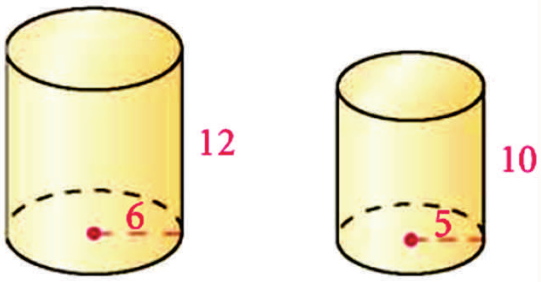
a.



b.



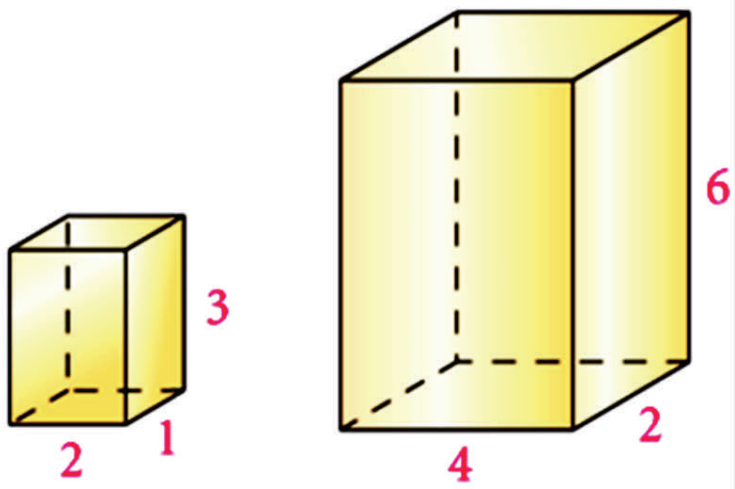
Are the two cylinders similar?
If so, give the similarity ratio.



Are the Prisms similar?

What is the similarity ratio?

Find the Surface Area and volume of each figure.



S.A. = _____ S.A. = _____

V = _____ V = _____

Theorem 11-12 Areas and Volumes of Similar Solids

If the similarity ratio of two similar solids is _____, then
(1) the ratio of their corresponding areas is _____, and
(2) the ratio of their volumes is _____.

Example: **Finding the Similarity Ratio**

Find the similarity ratio of two cubes with volumes of 729 cm^3 and 1331 cm^3.

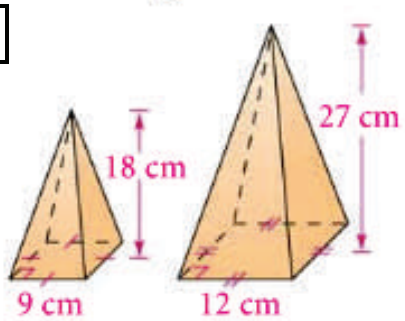
Find the similarity ratio of two similar prisms with surface areas 144 m^2 and 324 m^2.

Example: The volumes of two similar solids are 128 m^3 and 250 m^3. The surface area of the larger solid is 250 m^2. What is the surface area of the smaller solid?

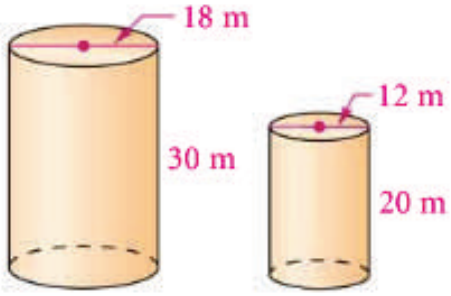
Assignment:

Are the two figures similar? If so, give the similarity ratio.

1.



2.



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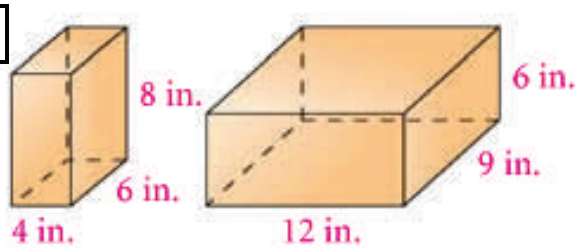

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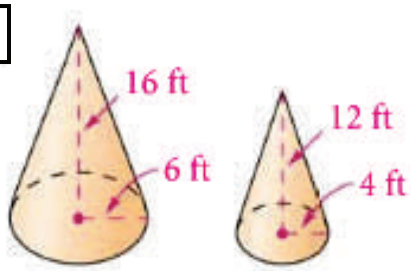
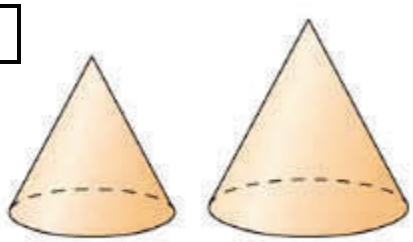


5. two cubes, one with 3-cm edges, the other with 4.5-cm edges

6. a cylinder and a square prism each with 3-in. radii and 1-in. heights

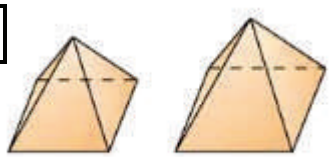
Each pair of figures is similar. Use the given information to find the similarity ratio of the smaller figure to the larger figure.

7.



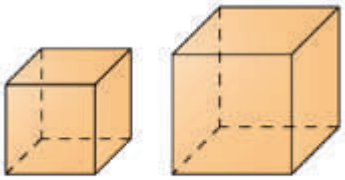
$V = 250\pi \text{ ft}^3$ $V = 432\pi \text{ ft}^3$

8.



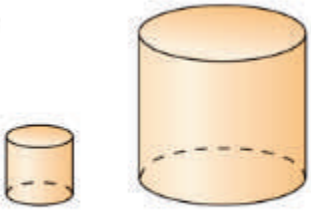
$V = 216 \text{ in.}^3$ $V = 343 \text{ in.}^3$

9.



S.A. $= 18 \text{ m}^2$ S.A. $= 32 \text{ m}^2$

10.



S.A. $= 20\pi \text{ yd}^2$ S.A. $= 125\pi \text{ yd}^2$

11. Two similar prisms have heights 4 cm and 10 cm.

a. What is their similarity ratio?

b. What is the ratio of their surface areas?

c. What is the ratio of their volumes?

12. One cylinder has height 4 cm. A larger cylinder has height 10 cm. The diameter of the larger cylinder is 2.5 times the diameter of the smaller cylinder. How many times the volume of the smaller cylinder is the volume of the larger cylinder?

(A) 2.5 (B) 4 (C) 6.25 (D) 15.625

13. The rectangular prism has dimensions 5 cm by 7.5 cm by 20 cm. What is the surface area in square centimeters?

(A) 750 (C) 287.5

(B) 575 (D) 65