

Math 8

Our Goal: To learn to find the surface areas
and volumes of similar solids

Warm Up: Put your homework in the basket, thank you

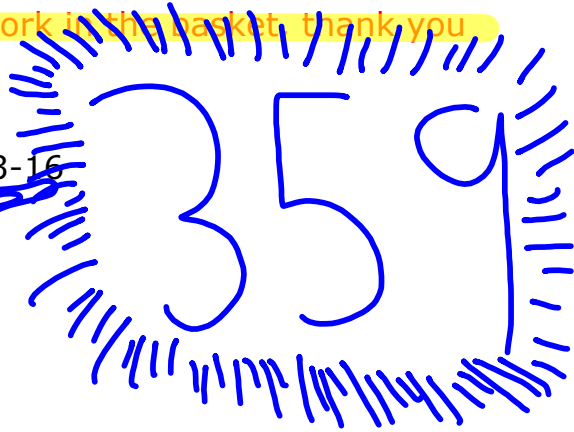
Today's homework

8.4 Exercises, p. 352-353: 3-16

Previous homework

8.3 Practice handout

p. 352-353: 3-16



Tell whether the ratios are equivalent.

1. $\frac{35}{20}, \frac{7}{4}$

2. $\frac{3}{8}, \frac{32}{12}$

3. $\frac{4}{8}, \frac{20}{24}$

4. $\frac{9}{2}, \frac{27}{6}$

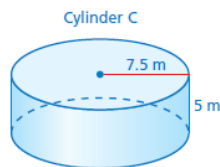
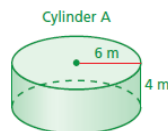
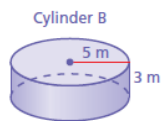
5. $\frac{14}{18}, \frac{12}{21}$

6. $\frac{14}{20}, \frac{21}{30}$

Essential Question

When the dimensions of a solid increase by a factor of k , how does the surface area change? How does the volume change?

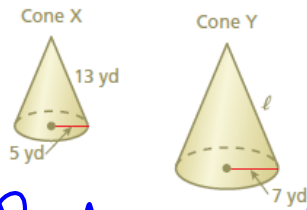
Which cylinder is similar to Cylinder A?



radius
height

$$\begin{array}{ccc}
 \frac{5}{3} & \frac{6}{4} & \frac{7.5}{5} \\
 1.6\bar{6} & 1.5 & 1.5 \\
 \frac{100}{60} & \frac{90}{60} & = \frac{90}{60}
 \end{array}$$

The cones are similar. Find the missing slant height l .



$$\frac{\text{Radius}}{\text{SH}} = \frac{5}{13} = \frac{7}{l}$$

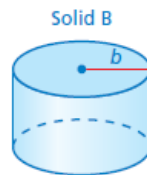
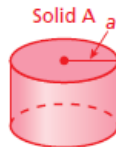
$$5l = 91 \quad l = 18.2$$

Key Idea

Volumes of Similar Solids

When two solids are similar, the ratio of their volumes is equal to the cube of the ratio of their corresponding linear measures.

$$\frac{\text{Volume of A}}{\text{Volume of B}} = \left(\frac{a}{b}\right)^3$$



The dimensions of the touch tank at an aquarium are doubled. What is the volume of the new touch tank?

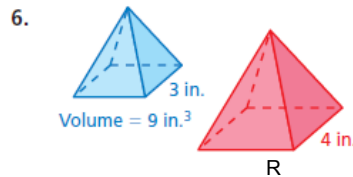
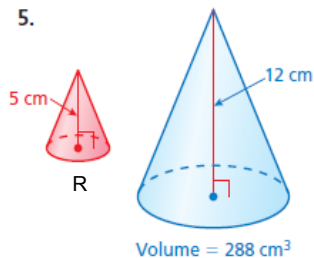


- (A) 150 ft^3
- (C) 8000 ft^3

- (B) 4000 ft^3
- (D) $16,000 \text{ ft}^3$ (•2)

If the dimensions double
the volume goes up by 2^3 , 8
times

The solids are similar. Find the volume of the red solid. Round your answer to the nearest tenth.



$$\frac{\text{Red}}{\text{Blue}} = \frac{5}{12}$$

$$\frac{5^3}{12^3} = \frac{125}{X}$$

$$X = 288$$

Height

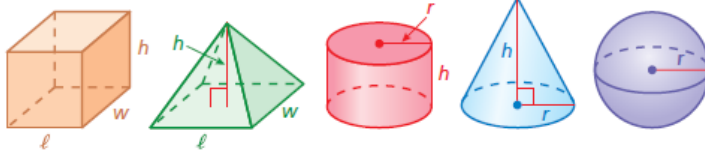
$$12^3 x = 5^3 \cdot 288$$

$$x = \frac{5^3 \cdot 288}{12^3}$$

$$x = 20.8$$

Key Ideas

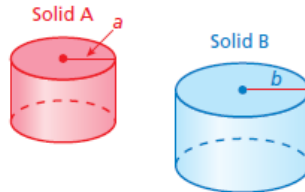
Linear Measures



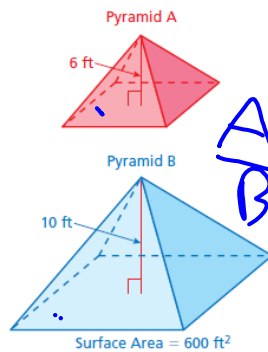
Surface Areas of Similar Solids

When two solids are similar, the ratio of their surface areas is equal to the square of the ratio of their corresponding linear measures.

$$\frac{\text{Surface Area of A}}{\text{Surface Area of B}} = \left(\frac{a}{b}\right)^2$$



The pyramids are similar. What is the surface area of Pyramid A?



$$\frac{A}{B} = \frac{\text{Height}^2}{\text{Height}^2}$$

$$\frac{6^2}{10^2} = \frac{x}{600}$$

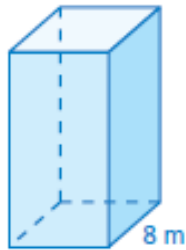
$$100x = 36 \cdot 600$$

$$100x = 21600$$

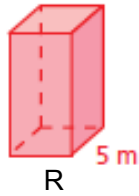
$$x = 216$$

The solids are similar. Find the surface area of the red solid. Round your answer to the nearest tenth.

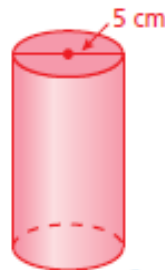
3.



Surface Area = 608 m^2



4.



R



Surface Area = 110 cm^2