

11-6 Similar Solids (Pages 584–588)

A pair of three-dimensional figures is classified as **similar solids** when they are the same shapes and their corresponding measurements are proportional. The ratio that compares the measurements of two similar solids is called the **scale factor**.

Given two similar solids Figure A and Figure B:

- The scale factor of corresponding sides of Figure A to Figure B is $\frac{a}{b}$.
- The ratio of the surface area of Figure A to the surface area of Figure B is $\frac{a^2}{b^2}$.
- The ratio of the volume of Figure A to the volume of Figure B is $\frac{a^3}{b^3}$.

Examples

The square prisms to the right are similar. Find the scale factor, the ratio of their surface areas, and the ratio of their volumes.

The scale factor is

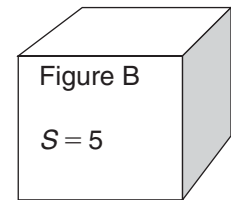
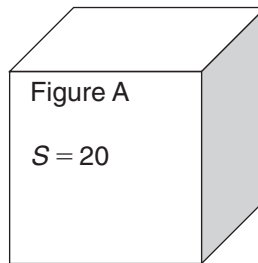
$$\frac{a}{b} = \frac{20}{5} = 4$$

The ratio of the surface areas is

$$\frac{a^2}{b^2} = \frac{4^2}{1^2} = 16$$

The ratio of the volumes is

$$\frac{a^3}{b^3} = \frac{4^3}{1^3} = 64$$



Practice

Triangular Prism X and triangular Prism Y are similar.

The scale factor of Prism X to Prism Y is $\frac{3}{4}$. Use this information for problem 1–4.

1. If the length of a side of Prism X is 9 feet, what is the length of the corresponding side of Prism Y?
2. If Prism X has a surface area of 88.8 feet², what is the surface area of Prism Y?
3. If the volume of Prism X is 35.1 feet³, what is the volume of Prism Y?
4. **Standardized Test Practice** The height of the triangular base of Prism Y is 3.5 feet. Find the height of the triangular base of Prism X.

A 4.7 feet **B** 6.2 feet **C** 8.3 feet **D** 2.6 feet

Answers: 1. 12 feet 2. 157.9 feet² 3. 83.2 feet³ 4. D