FINDING VOLUME

Volume measures the amount a solid figure can hold. Volume is measured in terms of units³ and can be measured in inches, feet, meters, centimeters, and millimeters.

- The formula for the **volume of a rectangular prism** is V = l · w · h, where l is the length, w is the width, and h is the height.

- The formula for the **volume of a cube** is V = s³, where s is a side of the square.

- The **volume of a triangular prism** is V = (1/2) · l · w · h.

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- The **volume of a cone** is V = (1/3)π r² · h, where r is the radius and h is the height.

- The **volume of a sphere** is V = (4/3)π r³, where r is the radius and π is 3.14.

- The figures of prisms, cylinders, pyramids, cones and spheres are all 3-D figures. The **3-D figures are made up of edges, faces and vertices**. The edge is where two faces meet. The face is the side of the figure. The vertex is the point where the edges meet.

How to use finding volume

The **volume** of 3-D figures can be determined by using the formula that corresponds to the figure. The volumes of all figures can be determined as long as the needed information is given.

- For example, what is the volume of a cone with a radius of 6 cm and a height of 15 cm?

Ex. $V_{cone} = (1/3)\pi r^2 \cdot h$
$= (1/3)(3.14)(6^2)(15)$
$V_{cone} = (1/3)(3.14)(36)(15) = 565.2\ cm^3$

If the volume of a figure is given, as well as the information needed to solve for volume except one value, the missing value can be found by substitutin

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Ex.

$\frac{33.49}{4.187} = \frac{4.187r^3}{4.187}$

$7.999 = r^3$ **$r^3 \approx 8$, $r \approx 2$ because $2 \cdot 2 \cdot 2 = 8$**

The radius of the sphere is approximately 2 m. A 3-D figure is made up of faces, edges and vertices. A rectangular prism has 6 faces, 12 edges and 8 vertices.

Try This!

1. What is the **volume** of the rectangular prism with a length of 3m, a width of 5 m and a height of 11m? $V = l \cdot w \cdot h$

2. What is the **volume of a triangular prism** with a length of 6 cm, a width of 7 cm and a height of 2 cm? $V = (1/2) \cdot l \cdot w \cdot h$

3. What is the **volume of a cylinder** with a radius of 4 ft and a height of 9 ft? $V = \pi r^2 \cdot h$

4. What is the **volume of a pyramid** with a height of 12 cm and a base of

5. What is a height of 18 in.?

6. What is the **volume of a sphere** with a radius of 27 cm and a height of 33cm? $V = (4/3)\pi r^3$

7. If the volume of a rectangular prism is 288 cm^3 and the length is 9 cm and the width is 8 cm, what is the height? $V = l \cdot w \cdot h$

8. If the volume of a triangular prism is 81 ft^3 and the width is 6 ft and the height is 3 ft, what is the length? $V = (1/2) \cdot l \cdot w \cdot h$

9. If the volume of a cylinder is 1230.88 m^3 and the radius is 7 m, what is the height? $V = \pi r^2 \cdot h$

10. If the volume of a pyramid is 125cm³ and the height is 15 cm, what is the radius? $V = (1/3)\ b^2 \cdot h$

11. If the volume of a cone is 1780.38 in.³ and the radius is 9 in., what is the height? **$V = (1/3)\pi\ r^2 \cdot h$**

12. If the volume of a sphere is 113.04ft, what is the radius? **$V = (4/3)\pi\ r^3$**

13. How many **faces** does a pyramid have?

14. How

15. How