

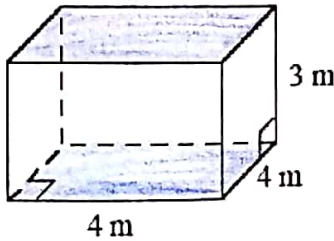
February 21

GUIDED NOTES: Volume

Volume - the amount of one shape stacked up inside of a 3D figure

$$V_{\text{prism}} = \text{area of base} \cdot \text{height of prism}$$

EX1.



base: rectangle

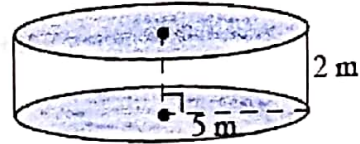
$$A = 4 \cdot 4$$

$$A = 16$$

$$V = 16 \cdot 3$$

$$V = 48 \text{ m}^3$$

EX2.



base: circle

$$A = \pi \cdot 5^2$$

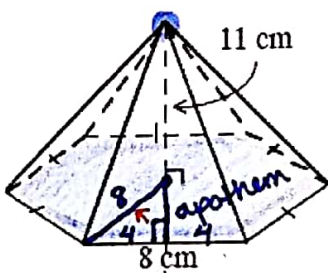
$$A = 78.54$$

$$V = 78.54 \cdot 2$$

$$V = 157.08 \text{ m}^3$$

$$V_{\text{pyramid}} = \frac{1}{3} \cdot \text{area of base} \cdot \text{height of pyramid}$$

EX3



$$\begin{aligned} a^2 + 4^2 &= 11^2 \\ a^2 + 16 &= 121 \\ -16 & \quad -16 \\ \hline a^2 &= 105 \\ a &= 10.25 \end{aligned}$$

$$P = 8 \cdot 6$$

$$P = 48$$

base: hexagon

$$A = \frac{1}{2} \cdot a \cdot P$$

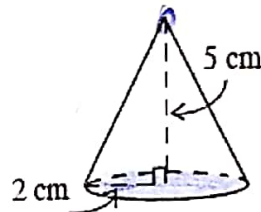
$$A = \frac{1}{2} \cdot 10.25 \cdot 48$$

$$A = 244.8$$

$$V = \frac{1}{3} \cdot 244.8 \cdot 11$$

$$V = 896.64 \text{ cm}^3$$

EX4.



base: circle

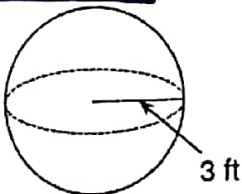
$$A = \pi \cdot 2^2$$

$$A = 12.57$$

$$V = \frac{1}{3} \cdot 12.57 \cdot 5$$

$$V = 20.94 \text{ cm}^3$$

EX5.



$$V_{\text{sphere}} = \frac{4}{3} \pi r^3$$

$$V = \frac{4}{3} \cdot \pi \cdot 3^3$$

$$V = 113.10 \text{ ft}^3$$

# Don't Be Cross With Me

The cross section of a three-dimensional figure shows the intersection of the three-dimensional figure with a plane.

<p><b>Cube</b></p> <p>Diagram 1: A cube is intersected by a horizontal plane parallel to the top face, resulting in a square cross-section.</p> <p>Diagram 2: A cube is intersected by a vertical plane parallel to one of the side faces, resulting in a rectangle cross-section.</p> <p>Diagram 3: A cube is intersected by a diagonal vertical plane, resulting in a triangle cross-section.</p> <p>Diagram 4: A cube is intersected by a vertical plane parallel to one of the side faces but not centered, resulting in a trapezoid cross-section.</p>	<p><b>Square Pyramid</b></p> <p>Diagram 1: A square pyramid is intersected by a horizontal plane parallel to the base, resulting in a square cross-section.</p> <p>Diagram 2: A square pyramid is intersected by a vertical plane parallel to one of the slanted faces, resulting in a trapezoid cross-section.</p> <p>Diagram 3: A square pyramid is intersected by a vertical plane parallel to one of the slanted faces and passing through the apex, resulting in a triangle cross-section.</p>
<p><b>Triangular Pyramid</b></p> <p>Diagram 1: A triangular pyramid is intersected by a horizontal plane parallel to the base, resulting in a triangle cross-section.</p> <p>Diagram 2: A triangular pyramid is intersected by a vertical plane parallel to one of the slanted faces, resulting in a triangle cross-section.</p>	<p><b>Sphere</b></p> <p>Diagram 1: A sphere is intersected by a horizontal plane passing through its center, resulting in a great circle cross-section.</p> <p>Diagram 2: A sphere is intersected by a horizontal plane not passing through its center, resulting in a smaller circle cross-section.</p>
<p><b>Cylinder</b></p> <p>Diagram 1: A cylinder is intersected by a horizontal plane parallel to the top circular face, resulting in a circle cross-section.</p> <p>Diagram 2: A cylinder is intersected by a vertical plane parallel to the side, resulting in a rectangle cross-section.</p>	<p><b>Cone</b></p> <p>Diagram 1: A cone is intersected by a horizontal plane parallel to the base, resulting in a circle cross-section.</p> <p>Diagram 2: A cone is intersected by a vertical plane parallel to one of the slanted faces, resulting in a triangle cross-section.</p>