SM 2

Date: **Section: 12.5**

Objective: Volume Notes

***Prism*:** A solid with two congruent, parallel polygons called ***bases*.**

Pyramid: A solid with a polygon for a ***base*** and triangles for all the other faces.

Cylinder: A solid with two congruent, parallel circular bases.

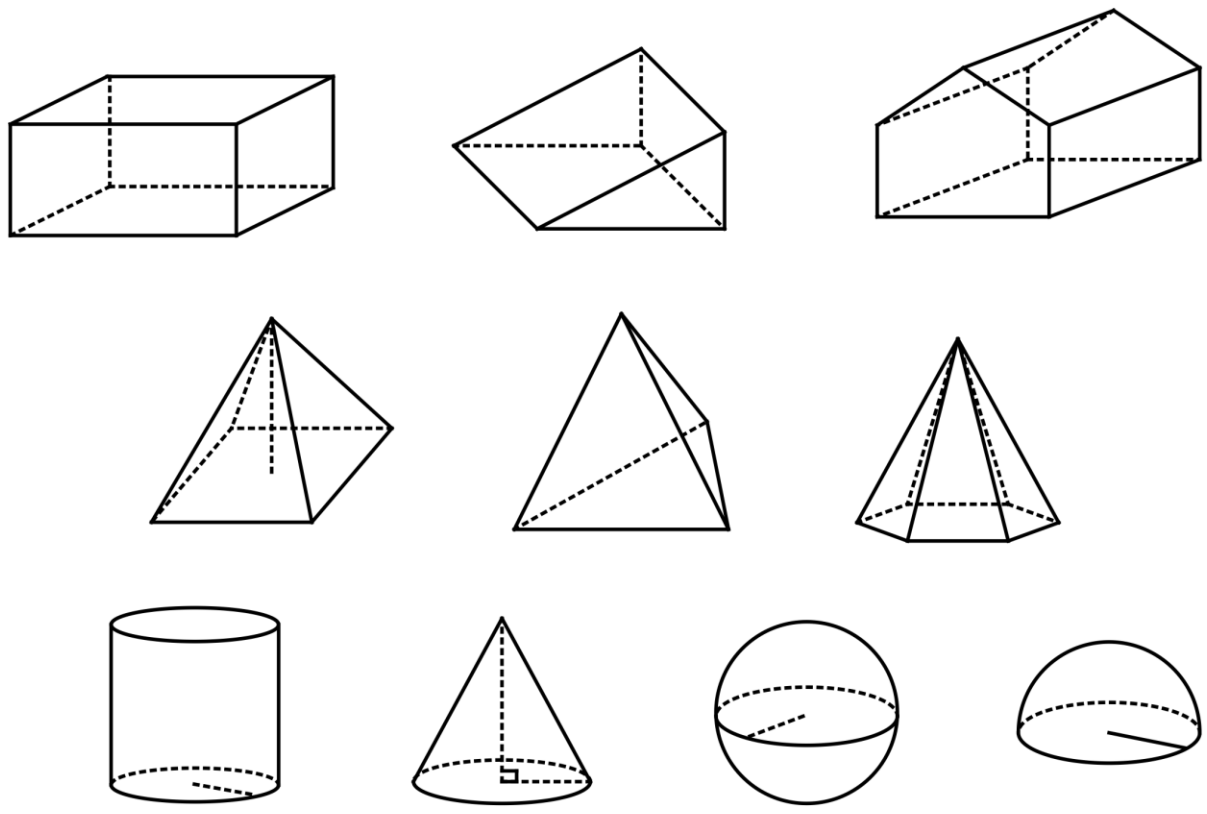
Cone: A solid with a circular base and a vertex that is not in the same plane as the base.

Sphere: All the points in space that are the same distance away from a fixed point, called the ***center.***

Hemisphere: Half of a sphere.

Height of a Prism or Cylinder: The length of a segment that is perpendicular to both bases.

Height of a Pyramid or Cone: The perpendicular distance from the base to the vertex.



Review of area formulas:

Area of a Rectangle: A = base times height or A = length times width

Area of a Triangle: $A = \frac{1}{2}(base\ of\ triangle)(height\ of\ triangle)$

Area of a Circle: $A = \pi r^2$

Volume of a Square or Rectangular Prism: Volume = area of base height

$V = Bh$ **OR** LWH

Volume of a Triangular Prism: Volume = area of base height

$V = Bh$ **OR**

$V = \frac{1}{2}(base\ of\ triangle)(height\ of\ triangle)\bullet(height\ of\ prism)$

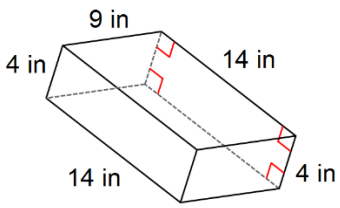
Volume of a Cylinder: Volume = area of base height

$V = Bh$ **OR**

$V = \pi r^2 h$

Examples: Find the volume of each prism or cylinder.

a)



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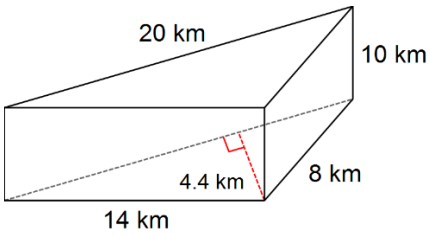

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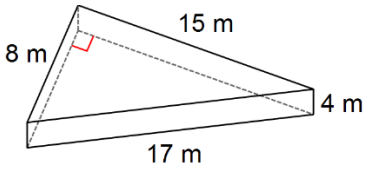

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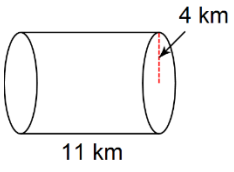

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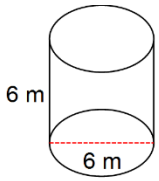


Volume of a Square or Rectangular Pyramid: $\text{Volume} = \frac{1}{3}$ area of base height

$$V = \frac{1}{3}Bh \qquad \textbf{OR}$$

$$V = \frac{1}{3}LWH$$

Volume of a triangular Pyramid: $\text{Volume} = \frac{1}{3}$ area of base height

$$V = \frac{1}{3}Bh \qquad \textbf{OR}$$

$$V = \frac{1}{3}\bullet\left[\frac{1}{2}(base\ of\ triangle)(height\ of\ triangle)\right]\bullet(height\ of\ pyramid)$$

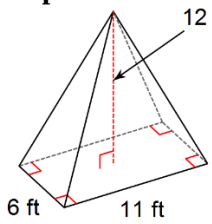
Volume of a Cone: $\text{Volume} = \frac{1}{3}$ area of base height

$$V = \frac{1}{3}Bh \qquad \textbf{OR}$$

$$V = \frac{1}{3}\pi r^2 h$$

Examples: Find the volume of each pyramid or cone.

a)



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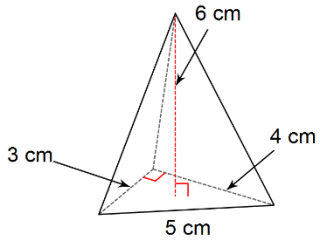

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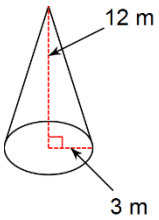

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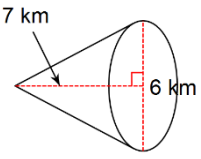

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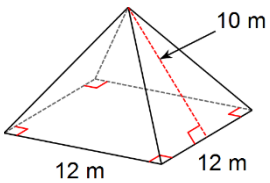

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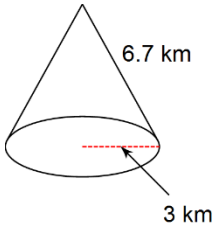
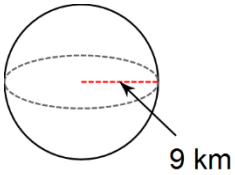


Volume of a Sphere: $V = \frac{4}{3}\pi r^3$ ***Volume of a Hemisphere:*** $V = \frac{1}{2} \bullet \frac{4}{3}\pi r^3$

Examples: Find the volume of each sphere or hemisphere.

a)



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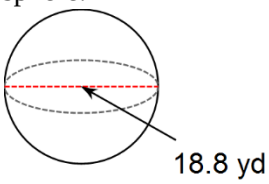

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