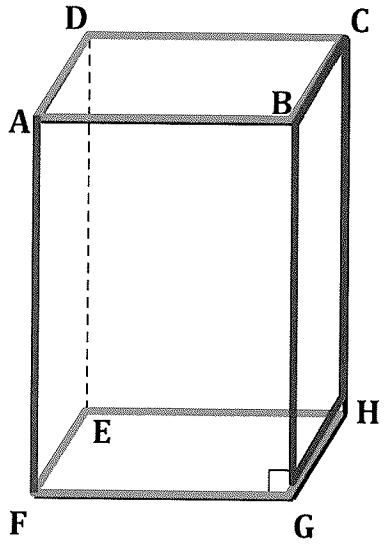
VOLUME OF PRISMS & CYLINDERS NOTES
GEOMETRY

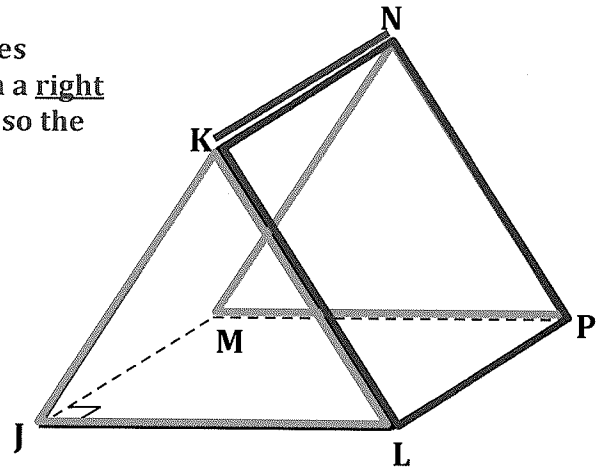
NAME: KEY
DATE: _____ **PERIOD:** ___

Learning Targets:
- ✓ Find the volume of a prism
- ✓ Find the volume of a cylinder

- ✸ A **prism** is a polyhedron with two congruent faces, called **bases**, that lie in parallel planes.
- ✸ The other faces, called **lateral faces**, are parallelograms formed by connecting the corresponding vertices of the bases.
- ✸ The segments connecting those vertices are called **lateral edges**.
- ✸ The **altitude** (or **height**) of a prism is the perpendicular distance between its bases.
- ✸ In a **right prism**, each lateral edge is perpendicular to both bases.
- ✸ Prisms that have lateral edges that are not perpendicular to the bases are called **oblique prisms.** We will only be studying right prisms.



bases
lateral faces
lateral edges (in a right prism this is also the height)

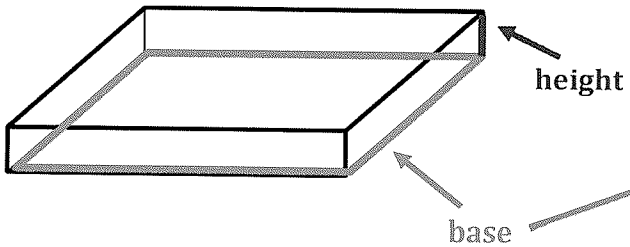


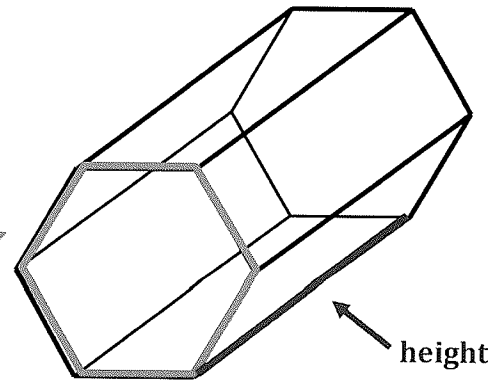
✸ Prisms are classified by the shape of their bases.

For #s 1–2, name each right prism. Then, label the base and height.

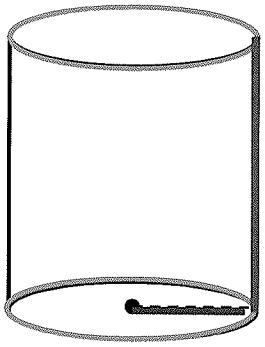
1) Name: Rectangular Prism

2) Name: Hexagonal Prism

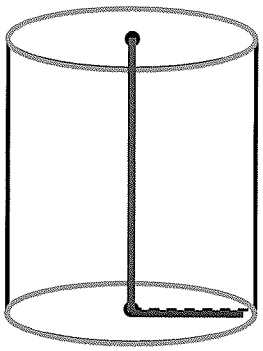




✸ A **cylinder** is a solid with congruent circular bases that lie in parallel planes.
✸ The **altitude** (or **height**) of a cylinder is the perpendicular distance between its bases.
✸ The **radius** of the base is also called the radius of the cylinder.



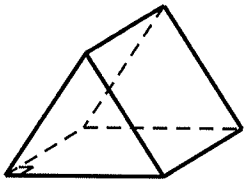
bases
radii
height



✸ The **volume of a solid** is the number of cubic units contained in its interior.

Volume

Prism: V= $\mathcal{B}$h



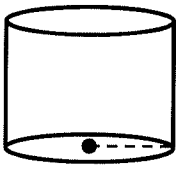
where,

$\mathcal{B}$ = area of the base

h = height of the solid

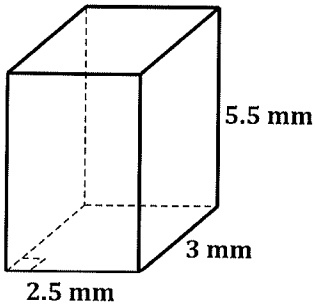
r = radius of the cylinder

Cylinder: V = $\mathcal{B}$h = $\pi r^2 h$



For #s 3–6, find the volume of the solid.

3) Round to the nearest *hundredth.*

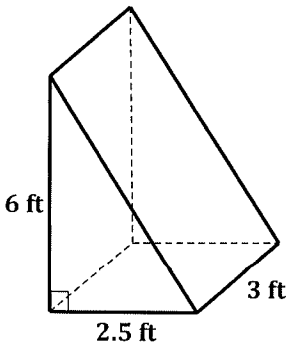


$V = Bh$

$V = (2.5 \cdot 3)(5.5)$

$V = 41.25 \text{ mm}^3$

4) Round to the nearest *tenth.*



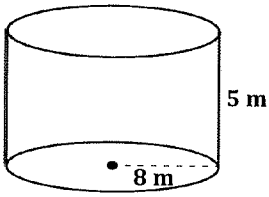
$V = Bh$

$V = \left(\frac{1}{2} \cdot 2.5 \cdot 6\right)(3)$

$V = 7.5(3)$

$V = 22.5 \text{ ft}^3$

5) Leave your answer in terms of π.

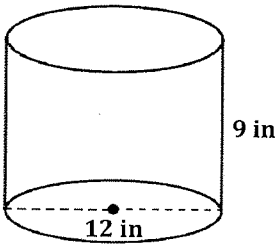


$V = \pi r^2 h$

$V = \pi(8)^2(5)$

$V = 320\pi \text{ m}^3$

6) Leave your answer in terms of π.



$V = \pi r^2 h$

$V = \pi(6)^2(9)$

$V = 324\pi \text{ in}^3$

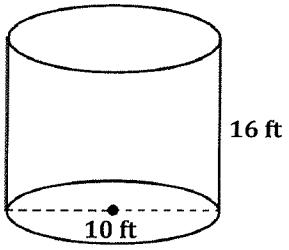
You Try! #7

Find the volume of the cylinder. Leave your answer in terms of π.

$V = \pi r^2 h$

$V = \pi(5)^2(16)$

$V = 400\pi \text{ ft}^3$



8) What is the radius of a cylinder with a height of 5 inches and a volume of 62.8 in³? Round your answer to the nearest *inch*.

$V = \pi r^2 h$

$62.8 = \pi r^2(5)$

$\frac{62.8}{5\pi} = r^2$

$r \approx 2 \text{ in}$

9) What is the length of a rectangular prism with a volume of 576 cm³, a height of 6 cm, and a width of 8 cm?

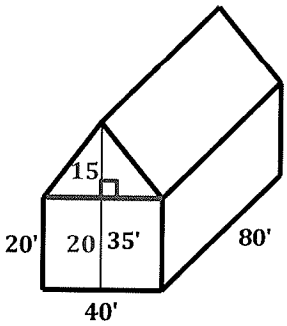
$V = Bh = lwh$

$576 = l(8)(6)$

$576 = 48l$

$l = 12 \text{ cm}$

10) Calculating the volume of the air in your home can help you determine how much heating and cooling your home will cost. Farmer Joe wants to find the air volume of his barn. The height of the barn (at the highest point) is 35 feet. Help Joe find the volume to the nearest cubic foot.



$\underbrace{V_{\Delta prism}} + \underbrace{V_{rectprism}}$

Bh	Bh = lwh
$\left(\frac{1}{2}\cdot 40\cdot 15\right)(80)$	(20)(40)(80)
300(80)	64000
24000	

$V = 24000 + 64000$

$V = 88000 \text{ ft}^3$