Geometry 12.4
Find volumes of prisms*
Find volumes of cylinders**

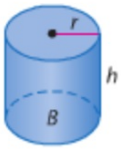
*6th grade standard
**8th grade standard

Find V & SA of spheres

volume (capacity)
units
composite solid
oblique
Cavalieri's principle

$V = B \cdot h$

KeyConcept Volume of a Cylinder

Words	The volume V of a cylinder is $V = Bh$ or $V = \pi r^2 h$, where B is the area of the base, h is the height of the cylinder, and r is the radius of the base.	Model 
Symbols	$V = Bh$	

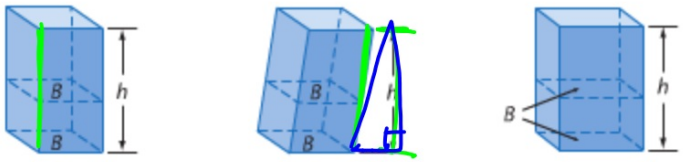
$= (\quad) h$

We can find volumes of oblique prisms/cylinders

KeyConcept Cavalieri's Principle

Words If two solids have the same height h and the same cross-sectional area B at every level, then they have the same volume.

Models



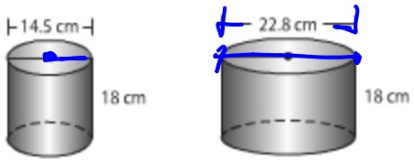
These prisms all have a volume of Bh.

Javier Larrea/age fotostock

$V = B \cdot h$

GuidedPractice

4. The containers at the right are filled with popcorn. About how many times as much popcorn does the larger container hold?



F 1.6 times as much

G 2.5 times as much

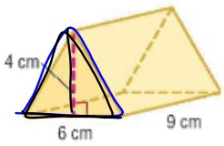
H 3.3 times as much

J 5.0 times as much

Whiteboards

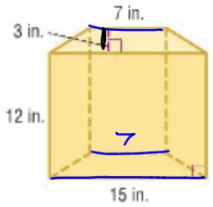
Examples 1 and 3 **Find the volume of each prism.**

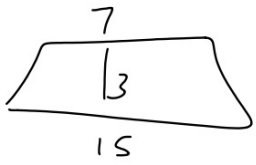
1.



$V = \left(\frac{1}{2} \cdot 6 \cdot 4\right) 9$

2.

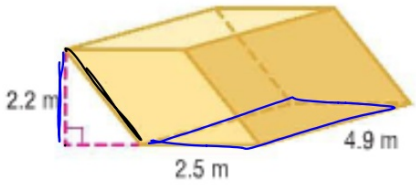




$V = \left(\frac{1}{2} \cdot 3(7+15)\right) 12$

3. the oblique rectangular prism shown at the right

4. an oblique pentagonal prism with a base area of 42 square centimeters and a height of 5.2 centimeters

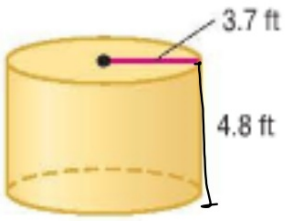


$V = (2.5 \cdot 4.9)(2.2)$

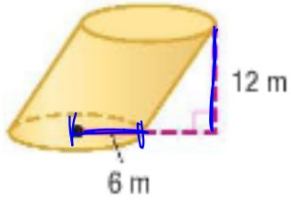
$V = (42)(5.2)$

Find the volume of each cylinder. Round to the nearest tenth.

5.



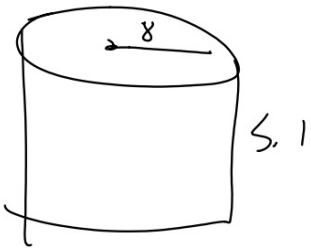
6.



$V = (\pi \cdot 3.7^2)(4.8)$

7. a cylinder with a diameter of 16 centimeters and a height of 5.1 centimeters

8. a cylinder with a radius of 4.2 inches and a height of 7.4 inches



9. **MULTIPLE CHOICE** A rectangular lap pool measures 80 feet long by 20 feet wide. If it needs to be filled to four feet deep and each cubic foot holds 7.5 gallons, how many gallons will it take to fill the lap pool?

$V = 80 \cdot 20 \cdot 4 = 6400 \text{ ft}^3$

$\times 7.5$

$48{,}000$ gal

$A = \frac{1}{2}h(b_1 + b_2)$

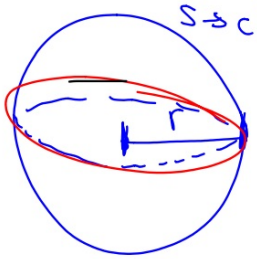
$A = bh$

Sphere

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

$SA = 4\pi r^2$

↑ S → circles



great circle (equator)

$C = 240$ ft

$\frac{240}{\pi} = \frac{\pi \cdot d}{\pi}$

$d = 76.394$

$r = 38.197$

$V = \frac{4}{3}(\pi)(38.197)^3$

$V = \frac{4}{3}(3.14)(57530.652) = 233444.01 \text{ ft}^3$

Semi-circle

hemisphere = $\frac{1}{2}$ sphere