

Volume of a Prism and Cylinder

Warm UP

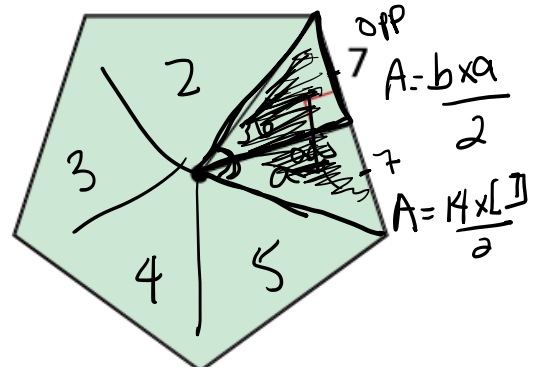
1. Find the measure of a central angle of a regular dodecagon (12-gon).

$$\frac{360}{12} = 30^\circ$$

1st step to finding the area of a polygon

- 1.) Central angle
- 2.) Central angle / 2 =
- 3.) Determine the type the approach
- 4.) Area of ~~Base~~ one triangle
- 5.) $\Delta \times \#$ of sides

2. Find the area of the regular pentagon.



$$1.) 360/5 = 72^\circ$$

$$2.) 72/2 = 36^\circ$$

3.) SOHCAHTOA

$$\frac{\tan 36^\circ}{1} = \frac{7}{a} \quad 7 = a \cdot \frac{\tan 36^\circ}{\tan 36^\circ}$$

$$a = \frac{7}{\tan 36^\circ}$$

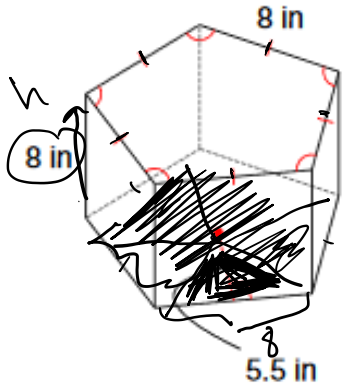
$$a = 9.6347$$

$$4.) A = \frac{17 \times 9.6347}{2} = 67.442$$

$$5.) A \text{ of pentagon} = 67.442 \times 5$$

$$A_{\text{pentagon}} = 337.2 \text{ units}^2$$

EX 1 Find the Volume of the Prism



$$V = Bh$$

$$V = [110] 8$$

$$V = 880 \text{ in}^3$$

B = Base Area

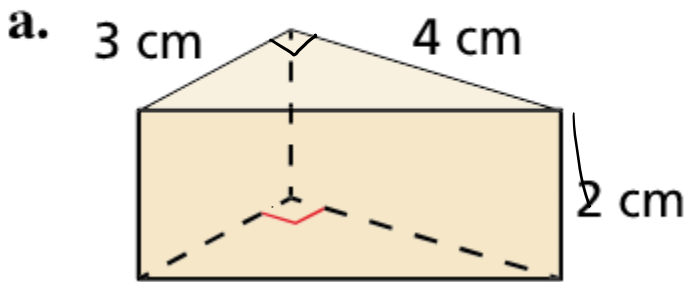
h = height of the prism

1) 2) 3) 4) $A = (8)(5.5) = 22$

5) $22 \times 5 = 110$

EX 2.

Find the volume of each prism.



$\Delta [h]$

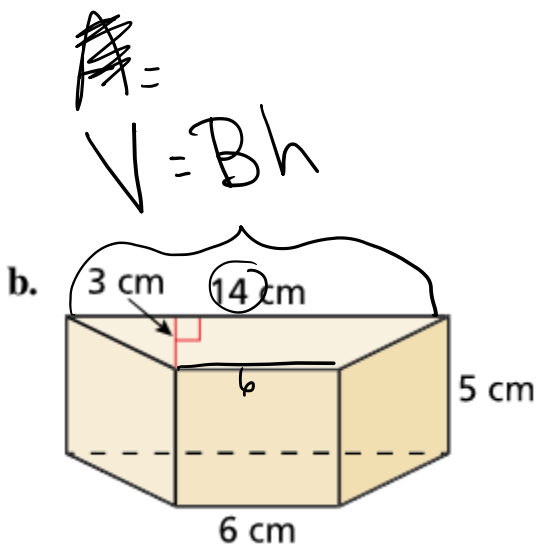
$V = Bh$

$V = [6] \cdot 2$

$V = 12 \text{ cm}^3$

$A = \frac{4 \times 3}{2}$

$A = 6$



$V = Bh$

A of trapezoid = $\frac{[b_1 + b_2]h}{2}$

$= \frac{[6 + 14] \cdot 3}{2}$

$B = \frac{(20)(3)}{2} = 30 \text{ cm}$

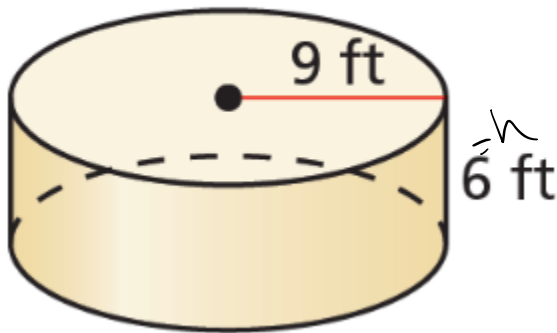
$V = (30) \cdot 5$

$V = 150 \text{ cm}^3$

Find the volume of each cylinder.

FORMULA

a.



$$V = Bh$$

$$V = (\pi r^2)h$$

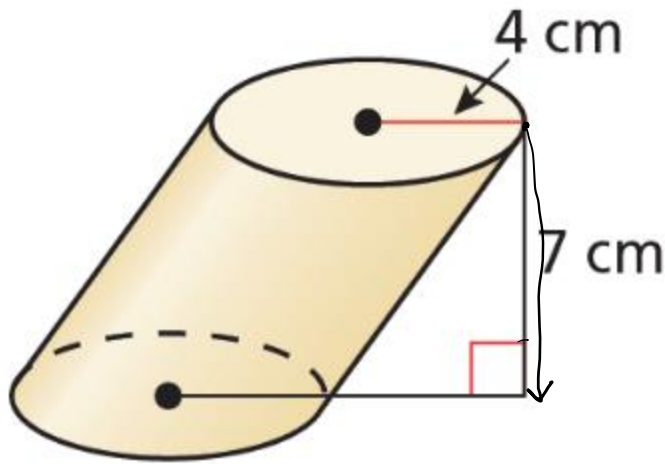
$$V = [\pi 9^2]6$$

$$V = [81\pi]6$$

$$V = 1520.8 \text{ ft}^3$$

Oblique Cylinder

b.



$$V = Bh$$

$$V = [\pi r^2] h$$

$$V = [\pi 4^2] 7$$

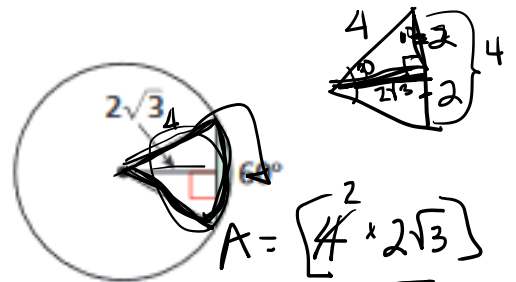
$$V = (16\pi) 7$$

$$V = 351.9 \text{ cm}^3$$

$$30^\circ - 60^\circ - 90^\circ$$

Ar
Are

30.



$$A = \frac{[4^2 \times 2\sqrt{3}]}{12}$$

$$A = [4\sqrt{3}]$$

$$A = 6.9282$$

~~Area of a sector~~ - $\Delta = D$

$$\left[\frac{60}{360} \times \pi r^2 \right] - \Delta = D$$

$$\left[\frac{60}{360} \times \pi (4)^2 \right] - \Delta = D$$

$$\left[\frac{\pi 4^2}{6} \right] - \Delta = D$$

$$8.37758$$

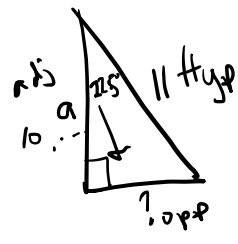
$$- 6.9282 =$$

$$\Delta = 1.4 \text{ unit}^2$$

Find the area of an octagon with a radius of 11 units.

$$A = \triangle \times \# \text{ of sides}$$

$$A = \triangle \times 8$$



$$1) \frac{360}{8} = 45^\circ$$

$$2) 45/2 = 22.5^\circ$$

3) SOHCAHTOA

$$\cos 22.5 = \frac{a}{11}$$

$$a = 11 \cdot \cos(22.5)$$

$$a = 10.16267$$

$$A = \left[\frac{(b \times a)}{2} \right] \times 8$$

$$A = \left[\frac{8.41903 \times 10.16267}{2} \right] \times 8$$

$$\sin 22.5 = \frac{?}{11}$$

$$? = 11 \cdot \sin(22.5)$$

$$? = 4.20951$$

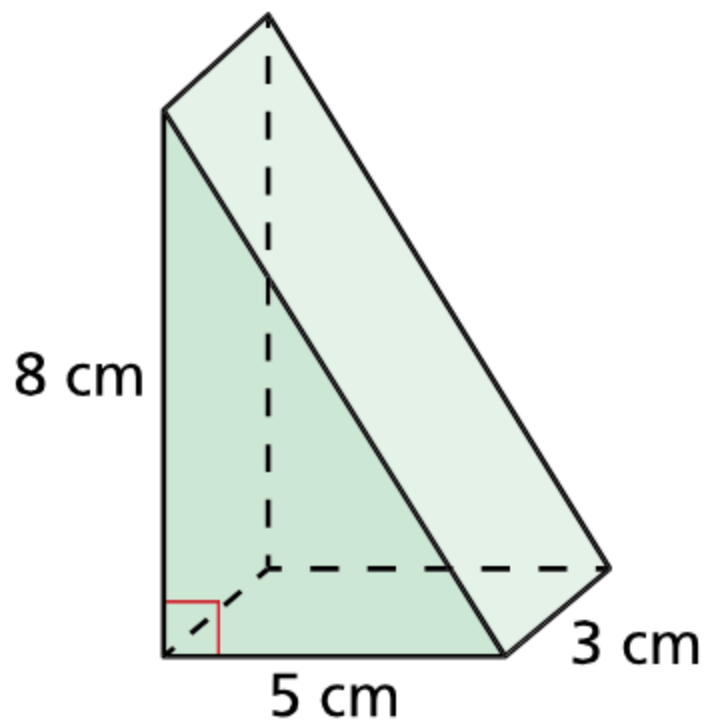
$$b = 2 \times 4.20951$$

$$b = 8.41903$$

$$A = 342.2 \text{ units}^2$$

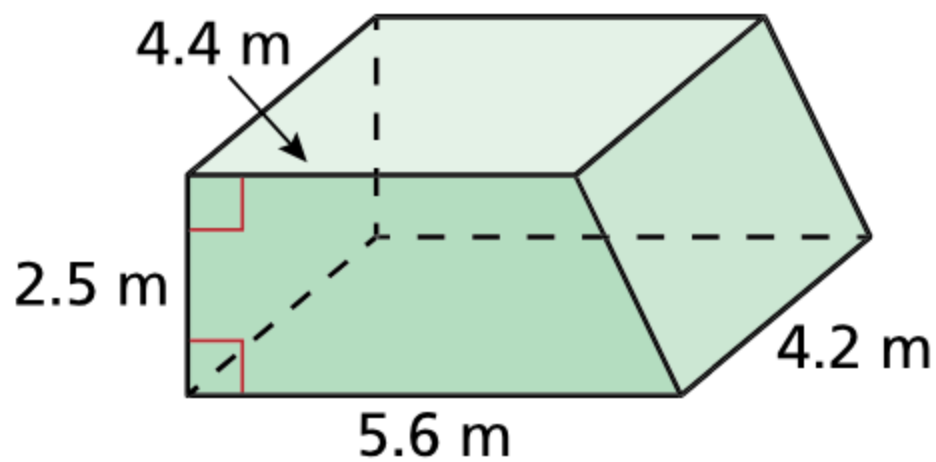
Find the volume of each prism.

a.



60 cubic centimeters

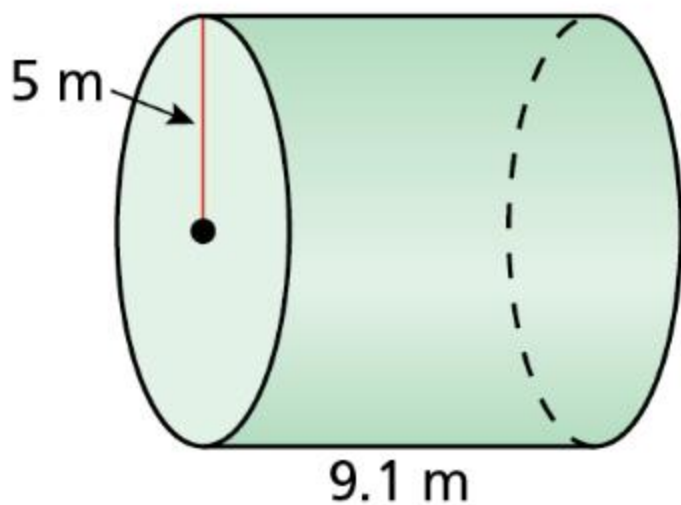
b.



52.5 cubic meters

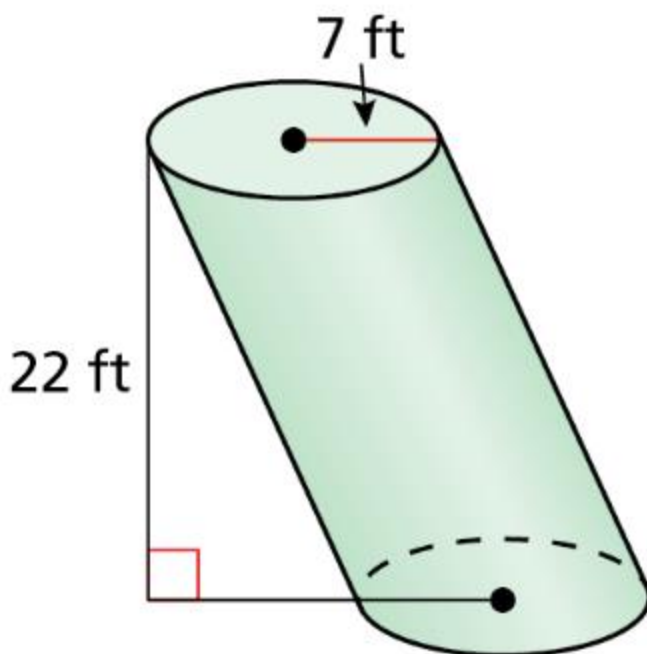
Find the volume of each cylinder.

a.



227.5π , or about 714.71 cubic meters

b.



1078π , or about 3386.64 cubic feet