

VOLUME OF A RIGHT PRISM

$V = Bh$ where B is the area of the base
& h is the height of the prism

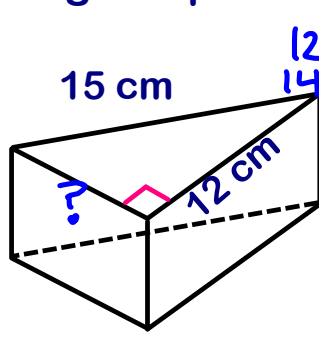
Example 1

Find the volume of the right triangular prism.

$V = Bh$ $B = 54$
 $h = 10$

$B: A = \frac{bh}{2}$
 $A = \frac{9 \cdot 12}{2} = 54$

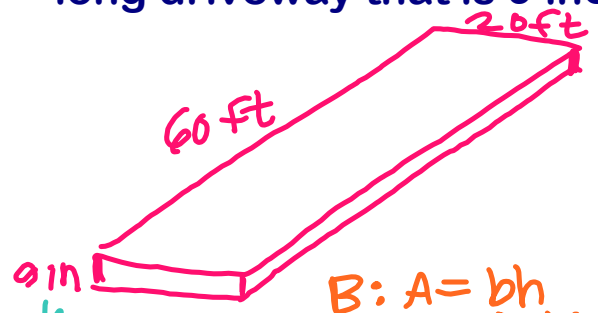
$V = (54)(10)$
 $V = 540 \text{ cm}^3$



$12^2 + ?^2 = 15^2$
 $144 + ?^2 = 225$
 $?^2 = 81$
 $? = 9$

Example 2

Find the cubic feet of cement that are for a 60-foot-long driveway that is 9 inches thick and 20 feet wide.



$V = Bh$ $B = 1200$
 $h = \frac{3}{4}$

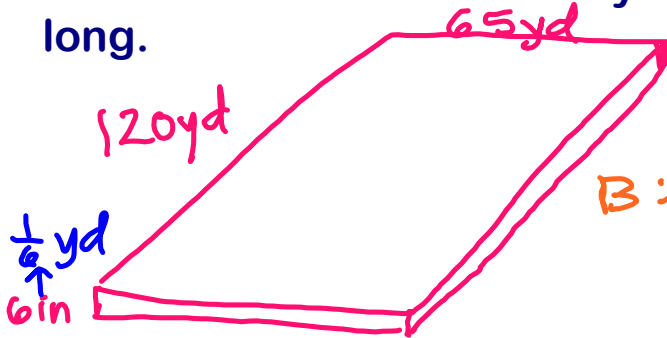
$B: A = bh$
 $A = (60)(20)$
 $A = 1200$

$\frac{9}{12} = \frac{3}{4} \text{ ft}$

$V = (1200)\left(\frac{3}{4}\right)$
 $V = 900 \text{ ft}^3$

Example 3

To resurface a football field, it was dug 6 inches deep. How many cubic ~~feet~~ ^{yard} of dirt are necessary to fill the field? A football field is 65 yards wide and 120 yards long.



$V = Bh$ $B = 7800$
 $h = \frac{1}{6}$

$B : A = bh$
 $A = (120)(65)$
 $A = 7800$

$V = (7800)(\frac{1}{6})$

$V = 1300 \text{ yd}^3$

$6 \text{ in} \cdot \frac{1 \cancel{\text{ft}}}{12 \cancel{\text{in}}} \cdot \frac{1 \text{ yd}}{3 \cancel{\text{ft}}} = \frac{6}{36} = \frac{1}{6}$

Example 4

A farm feeds its cows using a trapezoidal trough. Find the maximum volume in square feet of the trough with the indicated measures below.

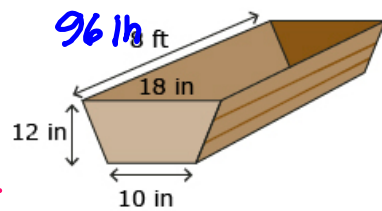
$V = Bh$ $B = 168$
 $h = 96$

$V = (168)(96) = 16,128 \text{ in}^3$

$B : A = \frac{1}{2}h(b_1 + b_2)$
 $A = \frac{1}{2} \cdot 12(18 + 10)$
 $A = 168$

$16,128 \text{ in}^3 \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ ft}}{12 \text{ in}}$

$\frac{16,128}{1728} \rightarrow \frac{28 \text{ ft}^3}{3}$



$8 \text{ ft} \cdot \frac{12 \text{ in}}{12 \text{ in}}$

VOLUME OF A RIGHT CYLINDER

$V = \pi r^2 h$ where h is the height of the prism

$$V = Bh$$

Example 5

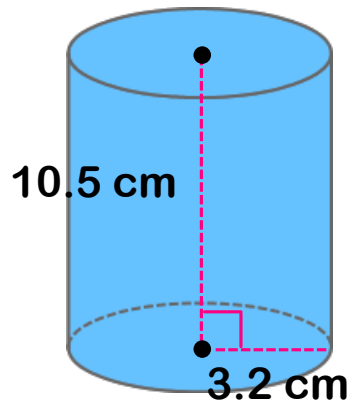
Find the volume of the right cylinder.

Round to the nearest tenth.

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

$$V = \pi (3.2)^2 (10.5)$$

$$V \approx 337.8 \text{ cm}^3$$



Example 6

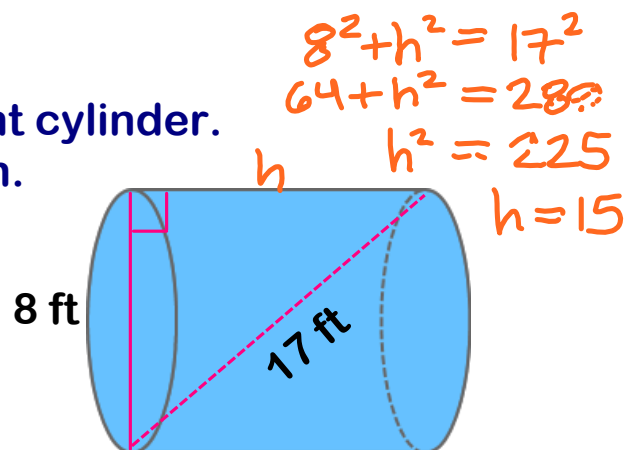
Find the volume of the right cylinder.

Round to the nearest tenth.

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

$$V = \pi (4)^2 (15)$$

$$V \approx 754.0 \text{ ft}^3$$



VOLUME OF A RIGHT CIRCULAR CONE

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

VOLUME OF A RIGHT PYRAMID

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

Example 7

Find the volume of a right circular cone with a radius of 5 centimeters and a height of 9 centimeters. Round your answer to the nearest tenth.

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

$$V = \frac{1}{3}\pi (5)^2 (9)$$

$$V \approx 235.6 \text{ cm}^3$$

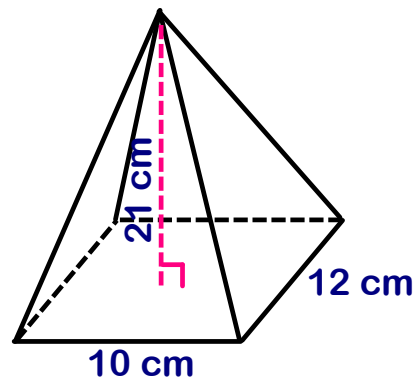
Example 8

Find the volume of the solid. Round to the nearest tenth.

$$V = \frac{1}{3}Bh \quad B = 120$$

$$V = \frac{1}{3}(120)(21) \quad h = 21$$

$$V = 840 \text{ cm}^3$$



$$B : A = bh$$

$$A = 10 \cdot 12 = 120$$

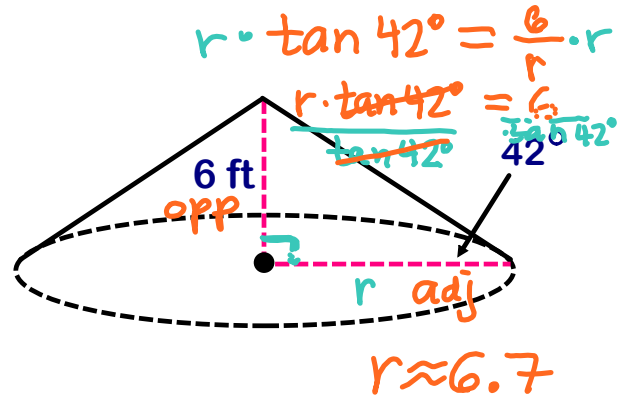
Example 9

Find the volume of the solid.
Round to the nearest tenth.

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

$$V = \frac{1}{3} \pi (6.7)^2 (6)$$

$$V \approx 282.1 \text{ ft}^3$$

**Example 10**

Find the volume of the solid.
Round to the nearest tenth.

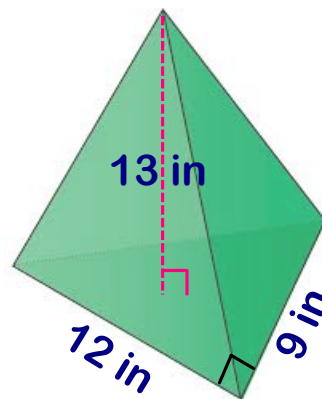
$$V = \frac{1}{3} Bh$$

$$B = 54$$

$$h = 13$$

$$V = \frac{1}{3} (54)(13)$$

$$V = 234 \text{ in}^3$$



$$B: A = \frac{1}{2} bh$$

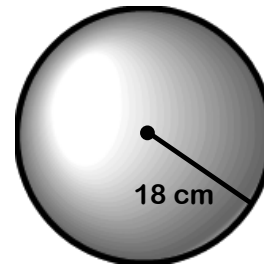
$$A = \frac{1}{2} \cdot 12 \cdot 9 = 54$$

VOLUME OF A SPHERE

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

Example 11

Find the volume of the sphere.
Round to the nearest tenth.

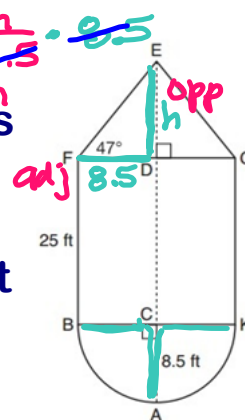


$$V = \frac{4}{3}\pi(18)^3$$

$$V \approx 24,429.0 \text{ cm}^3$$

Example 12

The water tower to the right is made of a cone, a cylinder, and a hemisphere. Find its volume. Round to the nearest tenth.



Cone

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

$$V = \frac{1}{3}\pi(8.5)^2(9.1)$$

$$V \approx 688.5 \text{ ft}^3$$

cylinder

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

$$V = \pi(8.5)^2(25)$$

$$V \approx 5674.5 \text{ ft}^3$$

1/2 of sphere

$$V = \frac{1}{2} \cdot \frac{4}{3}\pi r^3$$

$$V = \frac{2}{3}\pi(8.5)^3$$

Total V → 688.5 + 5674.5 + 1286.2 V ≈ 1286.2 ft³

$$V \approx 7649.2 \text{ ft}^3$$