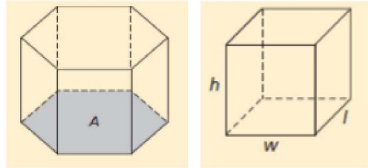
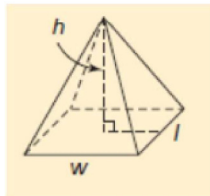


Lesson Four – Volumes of Right Pyramids and Right Cones



Volume of a Right Prism
 $V = \text{base area} \times \text{height}$
 $V = lwh$

← rect prism



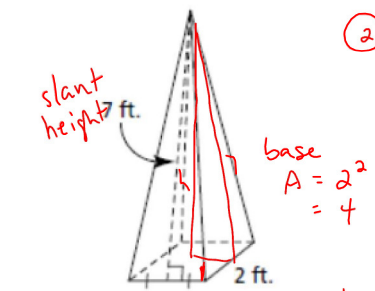
Volume of a Right Pyramid
 $V = \frac{1}{3}(\text{base area})(\text{height})$

← perpendicular height

$V = \frac{Bh}{3}$ ← on formula sheet

Example 1

Calculate the volume of this right square pyramid.



① Determine the height



$a^2 + b^2 = c^2$
 $h^2 + 1^2 = 7^2$
 $h^2 = 48$
 $h = \sqrt{48}$

∴ height is $\sqrt{48}$
 or 6.92...

← store decimal

② $V = \frac{Bh}{3}$
 $V = \frac{(4)(\sqrt{48})}{3}$
 $V = 9.2376\dots$

∴ Volume is 9.238 ft³

↑ recall:
 Volume is in cubic units.

Volume of Pyramids and Cones.notebook

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Measurement

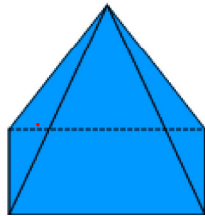
Lesson 4

Example 2

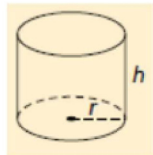
Determine the volume of a right rectangular pyramid with base dimensions 3.6 m by 4.7 m and a perpendicular height 6.9 m.

base


$$A = (3.6)(4.7) \\ = 16.92$$



$$V = \frac{Bh}{3} \\ = \frac{(16.92)(6.9)}{3} \\ = 38.916 \text{ m}^3$$



Volume of a Right Cylinder

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

Where r is the radius of the circle and h is the height of the cylinder

Example 3

The volume of a cylinder is 150 cm^3 . If the height is 10 cm, what is the radius:

$$V = \pi r^2 h \\ 150 = \pi r^2 (10) \\ \frac{150}{(10\pi)} = r^2 \\ 4.7746... = r^2 \\ r = 2.185...$$

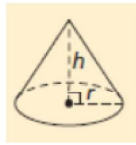
\therefore the radius is 2.185 cm

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Measurement

Lesson 4



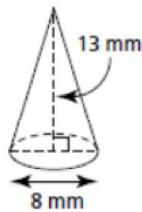
Volume of a Right Cone

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

Where r is the radius of the circle, and h is the height of the cone

Example 4

Determine the volume of this cone to the nearest cubic millimeter.



$$d = 8 \\ \therefore r = 4$$

$$V = \frac{\pi r^2 h}{3} \\ = \frac{\pi (4)^2 (13)}{3} \\ = 217.817... \\ \therefore \text{volume is } 218 \text{ mm}^3$$

Example 5

A cone has a height of 8 m and a volume of 300 m^3 . Determine the radius of the base of the cone:

$$V = \frac{\pi r^2 h}{3} \\ (3) \quad 300 = \frac{\pi r^2 (8)}{3} \quad (\times 3)$$

$$900 = 8\pi r^2$$

$$\frac{900}{8\pi} = r^2$$

$$35.809... = r^2$$

$$5.984... = r$$

$$\therefore \text{radius is } 5.984 \text{ m}$$

$$\text{pg. 36} \\ \# 2a, 3a, c, 10, \\ 14$$

$$\text{pg. 44} \\ \# 1a, e, 8, 9, 10$$