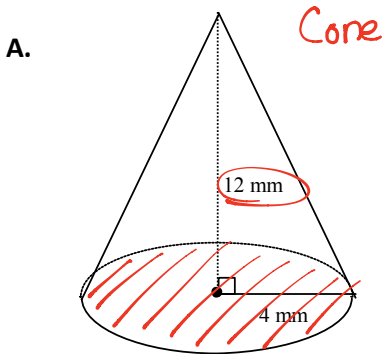Name:_____ Date:_____

10-1F Volume Notes: Cones

Volume – the space that a three-dimensional figure occupies   *units cubed

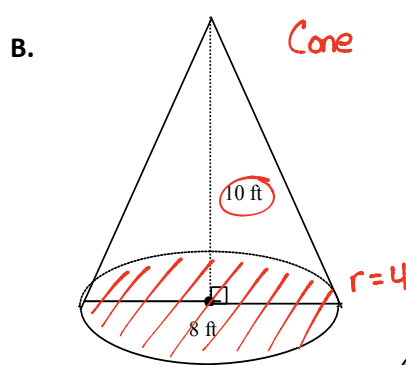For **Cones** – circular base across from apex

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

KEY TIPS:
1) Circle (height of figure)
2) Shade (bases)
3) Name (figure using the shape of the base)
4) Write basic formula for 3-D figure
5) Write specific formula (according to base)
6) Substitute values
7) Calculate
8) Check units/rounding

Ex. 1: Find the volume of each cone. Round to the nearest tenth if necessary.

A.   Cone

12 mm

4 mm

$$V = \frac{Bh}{3}$$
area of circle
$$= \frac{(\pi r^2)h}{3}$$
$$= \frac{\pi(4)^2(12)}{3}$$
$$= \frac{3.14(16)(12)}{3}$$
$$\boxed{V = 201 \text{ mm}^3}$$

B.   Cone

10 ft

r = 4

8 ft

$$V = \frac{\pi r^2 h}{3}$$
$$= \frac{\pi(4)^2(10)}{3}$$
$$= \frac{3.14(16)(10)}{3}$$
$$\boxed{V = 167.5 \text{ ft}^3}$$

Ex. 2: Find the volume of a cone that has a height of 12 inches and a radius of 2.5 inches.

12 in

2.5 in
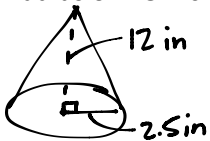
$$V = \frac{\pi r^2 h}{3}$$
$$= \frac{\pi(2.5)^2(12)}{3}$$
$$= \frac{3.14(6.25)(12)}{3}$$
$$\boxed{V = 78.5 \text{ in}^3}$$

Ex. 3: A cone with a diameter of 4 feet has a volume of 29.3 cubic feet. Find the height of the cone.

$$V = 29.3 \text{ ft}^3$$
$$d = 4 \text{ ft} \rightarrow r = 2 \text{ ft}$$
$$h = ?$$

$$V = \frac{\pi r^2 h}{3} \qquad 29.3 = \frac{3.14(2)^2 h}{3}$$
$$29.3 = \frac{3.14(4)h}{3}$$
$$29.3 = 4.2h$$
$$\frac{29.3}{4.2} = \frac{4.2h}{4.2}$$
$$\boxed{h = 7 \text{ ft}}$$

Ex. 4: A cone-shaped vase has a height of 15 centimeters and a diameter of 8 centimeters. If <u>one cubic centimeter is equal to one milliliter</u>, about how many milliliters of water will the vase hold?

$$V = ? \quad h = 15 \text{ cm} \quad d = 8 \text{ cm}$$
$$r = 4 \text{ cm}$$

$$V = \frac{\pi r^2 h}{3}$$
$$= \frac{\pi(4)^2(15)}{3}$$
$$= \frac{3.14(16)(15)}{3}$$
$$V = 251.2 \text{ cm}^3$$

$$1 \text{ cm}^3 = 1 \text{ mL}$$
$$\boxed{251.2 \text{ mL}}$$

HW: 10-1F Skills & Homework Practice Worksheets