

Day 3: Application of Volume

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Okay let us review from what we learned last class period.

Date _____

Cylinders

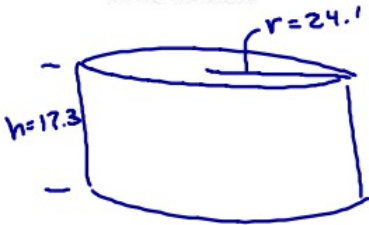
- 1) How do you find the volume of a cylinder?



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

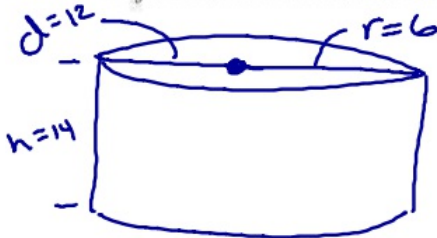
Draw and label a picture of what is being described. Round answers to the nearest tenth if necessary.

- 2) A cylinder has a base with a radius of 24.1cm and a height of 17.3cm. Find the volume to the nearest tenth.



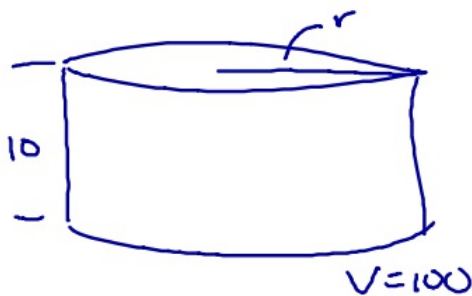
$$V = Bh$$
$$V = (\pi r^2)h$$
$$V = \pi (24.1)^2 \cdot 17.3$$
$$= 31550.8 \text{ cm}^3$$

- 3) A tank in the form of a cylinder is used for storing water. It has a diameter of 12 ft and a height of 14 ft. What is the volume of the tank?



$$V = \pi r^2 h$$
$$= \pi (6)^2 \cdot 14$$
$$= 1582.6 \text{ ft}^3$$

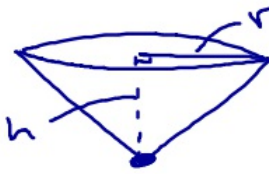
- 4) A cylinder has a volume of 100cm^3 and a height of 10cm. What is the radius of the base?



$$V = \pi r^2 h$$
$$\frac{100}{10} = \pi r^2 \frac{10}{10}$$
$$\frac{10}{\pi} = \pi r^2$$
$$\sqrt{\frac{10}{\pi}} = r$$
$$1.8 \text{ cm} = r$$

Cones

5) What is the volume formula of a cone?

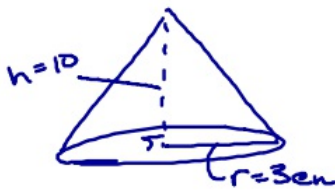


$$V = \frac{1}{3} B h$$

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

Draw and label a picture of what is being described. Round answers to the nearest tenth if necessary.

6) A cone has a radius of 3cm and a height of 10cm. What is the volume of the cone?

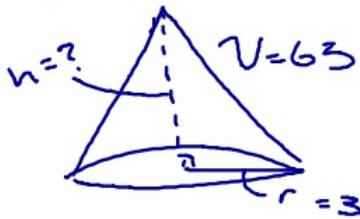


$$V = \frac{1}{3} \pi r^2 h$$

$$= \frac{1}{3} \pi (3)^2 \cdot 10$$

$$= 94.2 \text{ cm}^3$$

7) Given the volume of a cone is 65 in^3 and the radius is equal to 3in. What is the height of the cone?



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

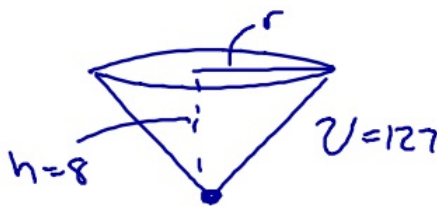
$$3 \cdot 65 = \frac{1}{3} \pi (3)^2 h$$

$$\frac{195}{\pi} = \frac{\pi \cdot 9 \cdot h}{9}$$

$$\frac{21.6}{\pi} = \frac{\pi h}{\pi}$$

$$6.9 \text{ in} = h$$

8) The volume of an ~~waffle~~ cone is 127 cm^3 and the height is 8 cm. What is the radius of the ice cream cone?



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

$$127 = \frac{1}{3} \pi r^2 \cdot 8$$

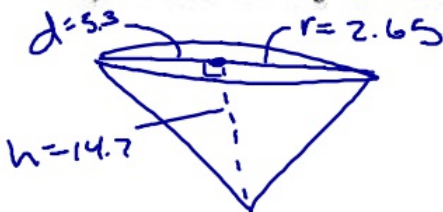
$$3 \cdot 15.875 = \frac{1}{3} \pi r^2$$

$$47.625 = \frac{\pi r^2}{\pi}$$

$$\sqrt{15.167} = \sqrt{r^2}$$

$$r = 3.9 \text{ cm}$$

9) If a cone has a height of 14.7 cm and a diameter of 5.3 cm, what is the volume?



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

$$= \frac{1}{3} \pi (2.65)^2 \cdot 14.7$$

$$= 108 \text{ cm}^3$$

Pyramids

10) What is the equation we use to find the volume of a pyramid?



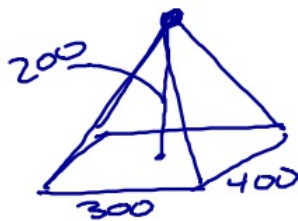
$$V = \frac{1}{3} B h$$

$$V = \frac{1}{3} (l \cdot w) h$$

$$V = \frac{1}{3} (\frac{1}{2} l w) h$$

Draw and label a picture of what is being described.

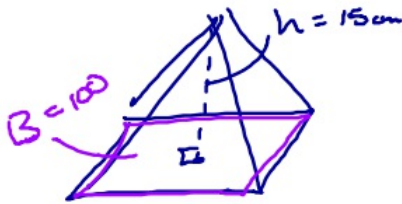
11) Find the volume of King Tut's pyramid. If the base has width of 300 ft and a length of 400 ft and if it stands at 200 ft tall. What is the volume of the pyramid?



$$V = \frac{1}{3} (300 \cdot 400) 200$$

$$= 8,000,000 \text{ ft}^3$$

12) Let the base of the pyramid have an area of 100 cm^2 and let it have a height of 15 cm. What is the volume of the pyramid?



$$V = \frac{1}{3} B h$$

$$= \frac{1}{3} (100)(15)$$

$$= 500 \text{ cm}^3$$

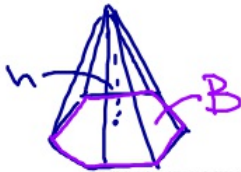
13) A hexagon pyramid has a volume of 374.4 yd^3 . If the height of the pyramid is 12 yd tall, what is the area of the base? **B**

$$V = 374.4$$

$$V = \frac{1}{3} B h$$

$$374.4 = \frac{1}{3} B \cdot 12$$

$$93.6 = B$$



If the apothem of the base is 5.2 yds, what does each side of the base measure?

$$B = \frac{1}{2} \cdot b \cdot a \cdot \#s$$

$$93.6 = \frac{1}{2} \cdot b \cdot 5.2 \cdot 6$$

$$6 \text{ yds} = b$$

Spheres

14) What is the equation that we use to find the volume of a sphere?



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

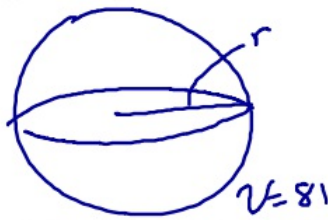
Draw and label a picture of what is being described.

15) If a ball has a radius of 4cm. What is the volume of the ball?



$$\begin{aligned} V &= \frac{4}{3} \pi r^3 \\ &= \frac{4}{3} \pi (4)^3 \\ &= 267.9 \text{ cm}^3 \end{aligned}$$

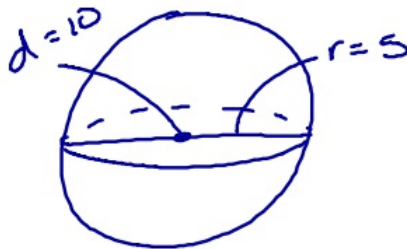
16) If the sphere has a volume of 81 cm^3 . What is the radius of the sphere?



$$\begin{aligned} V &= \frac{4}{3} \pi r^3 \\ 3 \cdot 81 &= \frac{4}{3} \pi r^3 \\ \frac{243}{4} &= \frac{4}{4} \pi r^3 \\ \frac{60.75}{\pi} &= \frac{\pi r^3}{\pi} \\ 19.35 &= r^3 \quad r = 2.7 \text{ cm} \end{aligned}$$

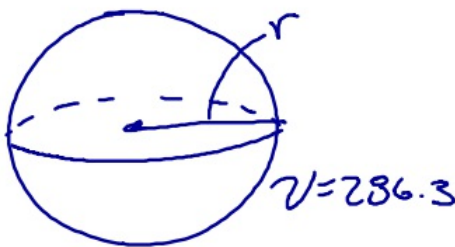
$$\begin{aligned} (\sqrt[3]{x})^2 &= x^{\frac{2}{3}} \\ \sqrt{x} &= x^{\frac{1}{2}} \\ &= x \cdot 5 \\ \sqrt[3]{r} &= r^{\frac{1}{3}} \end{aligned}$$

17) If an astroid that is spherical has a diameter of 10 ft. What is the volume of the astroid?



$$\begin{aligned} V &= \frac{4}{3} \pi r^3 \\ &= \frac{4}{3} \pi (5)^3 \\ &= 523.3 \text{ ft}^3 \end{aligned}$$

18) If the sphere has a volume of 286.3 m^3 . What is the radius of the sphere?



$$\begin{aligned} V &= \frac{4}{3} \pi r^3 \\ 286.3 &= \frac{4}{3} \pi r^3 \\ \frac{4}{3} \pi & \quad \frac{4}{3} \pi \\ \sqrt[3]{68.4} &= \sqrt[3]{r^3} \\ 4.1 \text{ m} &= r \end{aligned}$$