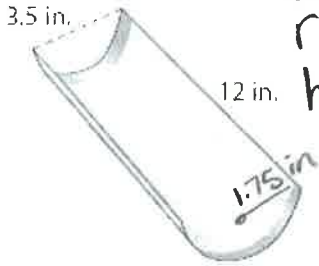


KEY

QR Campus Walk – Volume of Cylinders, Cones, and Spheres

Finish the problems you did not complete as you did your campus walk. Show your work on a piece of notebook paper. You may use a calculator.

1. A pan for baking French bread is shaped like half a cylinder. It is 12 inches long and 3.5 inches in diameter. What is the volume of uncooked dough that would fill this pan?



$$d = 3.5 \text{ in}$$

$$r = 1.75 \text{ in}$$

$$h = 12 \text{ in}$$

$$V = \frac{1}{2} Bh$$

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

$$V = \frac{1}{2} \cdot \pi \cdot 1.75^2 \cdot 12$$

$$V \approx 57.7 \text{ in}^3 \text{ of dough}$$

2. A cone and a cylinder have congruent height and bases. The volume of the cone is 18 m^3 . What is the volume of the cylinder? Explain.

Volume of cylinder is 3 times bigger than cone

$$18 \cdot 3 = 54 \text{ m}^3$$

$$V = Bh$$

cylinder

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

Cone

$$V = 3Bh$$

$$V = Bh$$

3. The diameter of a cone is x cm, the height is 18 cm, and the volume is 301.44 cm^3 . What is x ? Use 3.14 for π .

$$d = x$$

$$r = 0.5x \text{ cm}$$

$$h = 18 \text{ cm}$$

$$V = 301.44 \text{ cm}^3$$

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

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

$$301.44 = \frac{1}{3} \cdot 3.14 \cdot (0.5x)^2 \cdot 18$$

$$301.44 = \frac{1}{3} \cdot 3.14 \cdot 0.25x^2 \cdot 18$$

$$301.44 = 18.84 \cdot 0.25x^2$$

$$\frac{301.44}{4.71} = \frac{4.71x^2}{4.71}$$

$$\sqrt{64} = \sqrt{x^2}$$

$$x = 8 \text{ cm}$$

4. The green turtle lays eggs that are approximately spherical with an average radius of 2.25 centimeters. Each turtle lays an average of 113 eggs at one time. Find the total volume of these eggs, to the nearest cubic centimeter.

$$r = 2.25 \text{ cm}$$

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

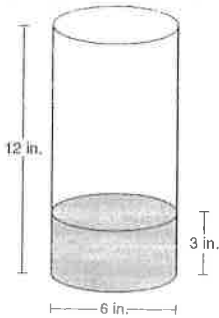
$$V = \frac{4}{3} \cdot \pi \cdot 2.25^3$$

$$V \approx 47.7 \text{ cm}^3$$

$$47.7 \cdot 113 =$$

$$5390 \text{ cm}^3$$

5. A cylindrical glass vase is 6 inches in diameter and 12 inches high. There are 3 inches of sand in the vase, as shown below.



$$d = 6 \text{ in}$$

$$r = 3 \text{ in}$$

$$h = 3 \text{ in}$$

$$V = Bh$$

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

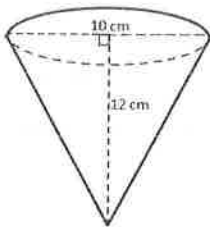
$$V = \pi \cdot 3^2 \cdot 3$$

$$V \approx 84.8 \text{ in}^3$$

Which of the following is closest to the volume of the sand in the vase?

- A) 85 in.³
- B) 254 in.³
- C) 54 in.³
- D) 339 in.³

6. A paper cone filled with roasted pecans will be sold at the carnival.



$$d = 10 \text{ cm}$$

$$r = 5 \text{ cm}$$

$$h = 12 \text{ cm}$$

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

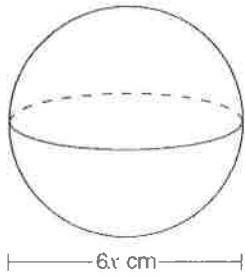
$$V = \frac{1}{3} \pi r^2 \cdot h$$

$$V = \frac{1}{3} \pi \cdot 5^2 \cdot 12$$

Which expression can be used to find the volume of the cone?

- A) $\frac{1}{3} \pi 12^2 (10)$
- B) $\frac{1}{3} \pi 6^2 (5)$
- C) $\frac{1}{3} \pi 10^2 (12)$
- D) $\frac{1}{3} \pi 5^2 (12)$

7. A sphere with a diameter of $6x$ centimeters is shown below.



$$d = 6x \text{ cm}$$

$$r = 3x \text{ cm}$$

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

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

Which of the following expressions best represents the volume of this sphere in cubic centimeters in terms of π ?

A) $\frac{4}{3} \pi (3x)^3$

B) $\frac{4}{3} \pi (6x)^3$

C) $4\pi (3x)^2$

D) $4\pi (6x)^2$

8. Ginny made a cylindrical clay vase for her art project. If the vase has a volume of 339 cubic inches and a diameter of 6 inches, which is the closest to the height of the vase?

A) 36 in.

B) 18 in.

C) 12 in.

D) 3 in.

$$d = 6 \text{ in}$$

$$r = 3 \text{ in}$$

$$V = 339 \text{ in}^3$$

$$V = Bh$$

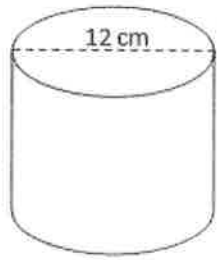
$$V = \pi r^2 \cdot h$$

$$339 = \pi \cdot 3^2 \cdot h$$

$$\frac{339}{28.27} = \frac{28.27h}{28.27}$$

$$h \approx 11.99 \text{ in}^3$$

9. What is the first step in the process of finding the volume of the cylinder?



$$d = 12 \text{ cm}$$

$$r = 6 \text{ cm}$$

$$V = Bh$$

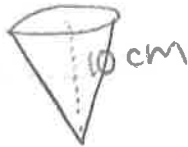
$$V = \pi r^2 \cdot h$$

$$\pi \cdot 6^2$$

- A) Calculate the area of the circle by finding the product of $\pi 12^2$.
- B) Calculate the area of the circle by finding the product of $\pi 6^2$.
- C) Calculate the circumference of the circle by finding the product of $\pi 12$.
- D) Calculate the circumference of the circle by finding the product of $\pi 6$.

10. A paper drinking cup in the shape of a cone has a volume of 160 cm^3 and a height of 10 centimeters. Which of the following is closest to the diameter of the cup in centimeters?

- A) 16 cm
- B) 4 cm
- C) 8 cm
- D) 16747 cm



$$V = 160 \text{ cm}^3$$

$$h = 10 \text{ cm}$$

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

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

$$160 = \frac{1}{3} \cdot \pi \cdot r^2 \cdot 10$$

$$\frac{160}{10.47} \approx \frac{10.47 \cdot r^2}{10.47}$$

$$\sqrt{15.28} \approx \sqrt{r^2}$$

$$r \approx 3.91$$

$$d \approx 2 \cdot 3.91$$

$$d \approx 7.82 \text{ cm}$$