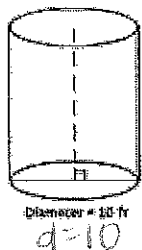


Study Guide for Volume

1. Find the volume of the cylinder below:

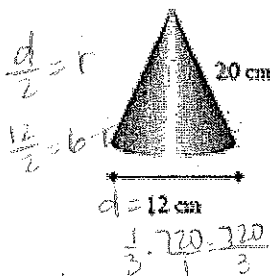


$\frac{d}{2} = r$
 $\frac{10}{2} = 5 = r$

a. $525\pi \text{ ft}^3$
b. $210\pi \text{ ft}^3$
c. $2100\pi \text{ ft}^3$
d. $25\pi \text{ ft}^3$

$V = \pi r^2 h$
 $V = \pi \cdot 5^2 \cdot 21$
 $V = \pi \cdot 25 \cdot 21$
 $V = \pi \cdot 525$
 $V = 525\pi \text{ ft}^3$

4. Find the volume of the cone below:

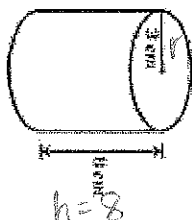


$\frac{d}{2} = r$
 $\frac{12}{2} = 6 = r$

$V = \frac{1}{3} \pi r^2 h$
 $V = \frac{1}{3} \pi \cdot 6^2 \cdot 20$
 $V = \frac{1}{3} \pi \cdot 36 \cdot 20$
 $V = \frac{1}{3} \pi \cdot 720$
 $V = \frac{720}{3} \pi \text{ cm}^3$

- a. $\frac{120}{3} \pi \text{ cm}^3$
b. $\frac{240}{3} \pi \text{ cm}^3$
c. $\frac{720}{3} \pi \text{ cm}^3$
d. $\frac{20}{3} \pi \text{ cm}^3$

2. Find the volume of the cylinder below:



a. $\approx 75.36 \text{ cm}^3$
b. $\approx 226.08 \text{ cm}^3$
c. $\approx 24 \text{ cm}^3$
d. $\approx 57.68 \text{ cm}^3$

$V = \pi r^2 h$
 $V = \pi \cdot 3^2 \cdot 8$
 $V = \pi \cdot 9 \cdot 8$
 $V = \pi \cdot 72$
 $V \approx (3.14)(72)$
 $V \approx 226.08 \text{ cm}^3$

5. Find the volume of the sphere below:



$\frac{d}{2} = r$
 $\frac{6}{2} = 3 = r$

$V = \frac{4}{3} \pi r^3$
 $V = \frac{4}{3} \pi \cdot 3^3$
 $V = \frac{4}{3} \pi \cdot 27$
 $V = 36\pi \text{ mi}^3$

- a. $112\pi \text{ m}^3$
b. $8\pi \text{ m}^3$
c. $36\pi \text{ m}^3$
d. $24\pi \text{ m}^3$

3. Find the volume of the cone below:

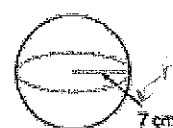


$\frac{72}{1} \cdot \frac{1}{3}$
 $= \frac{72}{3} = 24$

a. $\frac{24}{3} \pi \text{ cm}^3$
b. $\frac{9}{3} \pi \text{ cm}^3$
c. $\frac{8}{3} \pi \text{ cm}^3$
d. $\frac{72}{3} \pi \text{ cm}^3$

$V = \frac{1}{3} \pi r^2 h$
 $V = \frac{1}{3} \pi \cdot 3^2 \cdot 8$
 $V = \frac{1}{3} \pi \cdot 9 \cdot 8$
 $V = \frac{1}{3} \pi \cdot 72$
 $V = \frac{72}{3} \pi \text{ cm}^3$

6. Find the volume of the sphere below:



$V = \frac{4}{3} \pi r^3$
 $V = \frac{4}{3} \pi \cdot 7^3$
 $V = \frac{4}{3} \pi \cdot 343$
 $V = \frac{1372}{3} \pi \text{ cm}^3$

- a. $\frac{1372}{3} \pi \text{ cm}^3$
b. $\frac{343}{3} \pi \text{ cm}^3$
c. $\frac{7}{3} \pi \text{ cm}^3$
d. $49\pi \text{ cm}^3$

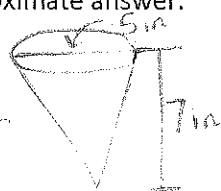
Real World Scenarios: For each scenario, draw a picture and label each known value. Then, solve the problem. Be sure to show all work and write all formulas!

7. Many towns have water tanks that they use for farming. Jeff's town has a cylinder shaped water tank that has a 4m radius and a 9m height. How much water can it hold?



$V = \pi r^2 h$
 $V = \pi \cdot 4^2 \cdot 9$
 $V = \pi \cdot 16 \cdot 9$
 $V = 144\pi \approx 452.16 \text{ m}^3$

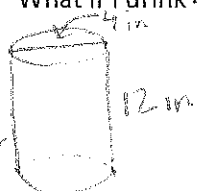
8. Mya went to the concession stand at the movie theater. She bought popcorn that came in a container shaped like a cone. The container was 7 inches high and the diameter was 5 inches. What is the volume of the container? Give an approximate answer.



$\frac{d}{2} = r$
 $\frac{5}{2} = 2.5 = r$

$V = \frac{1}{3} \pi r^2 h$
 $V = \frac{1}{3} \pi (2.5)^2 \cdot 7$
 $V = \frac{1}{3} \pi \cdot 6.25 \cdot 7$
 $V = \frac{1}{3} \pi \cdot 43.75$
 $V = \frac{43.75}{3} \pi \approx 45.79 \text{ in}^3$

9. I filled a glass with water. The glass is 12 inches tall and 4 inches across. How much water will I drink if I fill it to the top? What if I drink 4 glasses? Use 3.14 for π



$\frac{d}{2} = r$
 $\frac{4}{2} = 2 = r$

$V = \pi r^2 h$
 $V = \pi \cdot 2^2 \cdot 12$
 $V = \pi \cdot 4 \cdot 12$
 $V = \pi \cdot 48 \approx (3.14)(48) \approx 150.72 \text{ in}^3$

four glasses: $4(150.72)$
 $\approx 602.88 \text{ in}^3$