

Grade 8 · Volume of Cylinders, Cones and Spheres · Quiz

Common Core 8.G.C.9 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

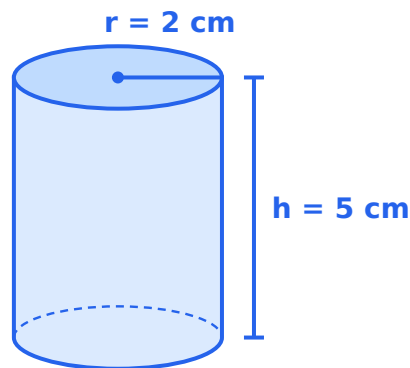
This 10-question quiz checks the volume formulas for cylinders, cones and spheres from standard 8.G.C.9. Questions include radius and diameter, missing dimensions, and real-world problems. Each wrong answer matches a common mistake, so read the explanation after every question.

Grade 8 Common Core: 8.G.C.9

Questions

Question 1

What is the volume of the cylinder?

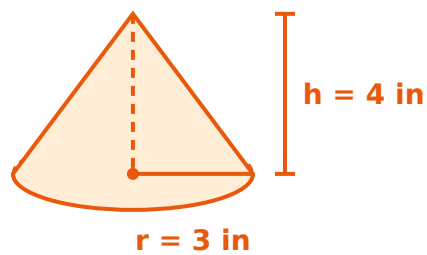


Cylinder, radius 2 cm, height 5 cm.

- A. $20\pi \text{ cm}^3$
- B. $10\pi \text{ cm}^3$
- C. $80\pi \text{ cm}^3$
- D. $100\pi \text{ cm}^3$

Question 2

What is the volume of the cone?

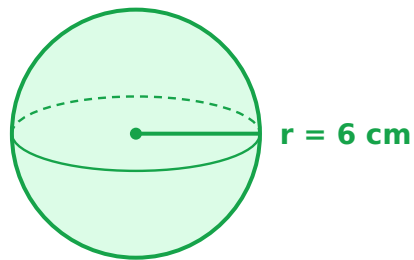


Cone, radius 3 in, height 4 in.

- A. $36\pi \text{ in}^3$
- B. $4\pi \text{ in}^3$
- C. $48\pi \text{ in}^3$
- D. $12\pi \text{ in}^3$

Question 3

What is the volume of the sphere?



Sphere, radius 6 cm.

- A. $48\pi \text{ cm}^3$
- B. $288\pi \text{ cm}^3$
- C. $216\pi \text{ cm}^3$
- D. $2,304\pi \text{ cm}^3$

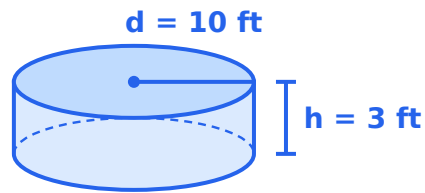
Question 4

A cone and a cylinder have the same radius and the same height. The volume of the cone is what fraction of the volume of the cylinder?

- A. $\frac{1}{3}$
- B. $\frac{1}{2}$
- C. $\frac{1}{4}$
- D. $\frac{1}{5}$

Question 5

What is the volume of the cylinder?



Cylinder, diameter 10 ft, height 3 ft.

- A. $75\pi \text{ ft}^3$
- B. $30\pi \text{ ft}^3$
- C. $300\pi \text{ ft}^3$
- D. $150\pi \text{ ft}^3$

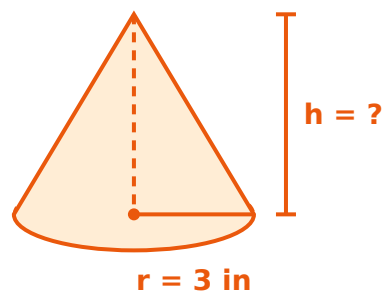
Question 6

A cylinder has a volume of $180\pi \text{ cm}^3$ and a radius of 6 cm. What is its height?

- A. 30 cm
- B. 2.5 cm
- C. 15 cm
- D. 5 cm

Question 7

A cone has a volume of $15\pi \text{ in}^3$ and a radius of 3 in. What is its height?

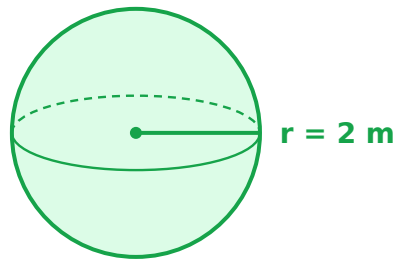


Cone with radius 3 in; the height is unknown.

- A. 15 in
- B. 45 in
- C. $\frac{5}{3}$ in
- D. 5 in

Question 8

Use 3.14 for π . What is the volume of the sphere, rounded to the nearest hundredth?



Sphere, radius 2 m.

- A. 16.75 m^3
- B. 33.49 m^3
- C. 100.48 m^3
- D. 50.24 m^3

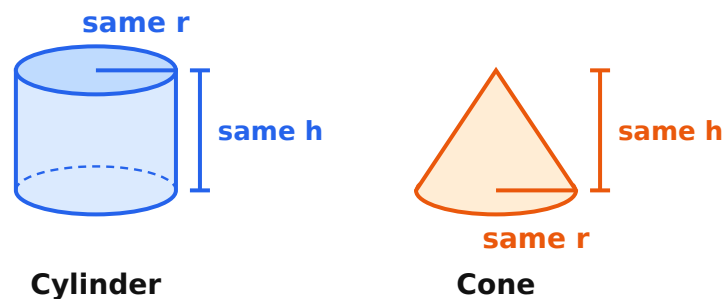
Question 9

A water bottle is a cylinder with a radius of 4 cm and a height of 20 cm. Use 3.14 for π . About how many cubic centimeters of water does it hold?

- A. 251.2
- B. 4,019.2
- C. 1,004.8
- D. 334.9

Question 10

A paper cone cup holds $24\pi\text{ in}^3$. A cylinder has the same radius and height as the cone. What is the volume of the cylinder?



A cone and a cylinder with matching dimensions.

- A. $8\pi\text{ in}^3$
- B. $72\pi\text{ in}^3$
- C. $48\pi\text{ in}^3$
- D. $96\pi\text{ in}^3$

Answer key

1. **A** - $V = \pi r^2 h = \pi(4)(5) = 20\pi$. Forgetting to square gives 10π ; using the diameter 4 as the radius gives 80π .
2. **D** - $V = \frac{1}{3}\pi(9)(4) = 12\pi$. Forgetting the $\frac{1}{3}$ gives 36π ; not squaring the radius gives 4π .
3. **B** - $V = \frac{4}{3}\pi(6)^3 = \frac{4}{3}\pi \cdot 216 = 288\pi$. Squaring instead of cubing gives 48π ; forgetting $\frac{4}{3}$ gives 216π .
4. **C** - The cone formula is the cylinder formula multiplied by $\frac{1}{3}$, so the cone holds one third as much. Three cones of water fill the cylinder.
5. **A** - The radius is $10 \div 2 = 5$, so $V = \pi(25)(3) = 75\pi$. Using 10 as the radius gives 300π ; $\pi \cdot 10 \cdot 3 = 30\pi$ forgets to square.
6. **D** - $180\pi = \pi(36)h$, so $h = 180 \div 36 = 5$. Dividing by 6 instead of 36 gives 30.
7. **D** - $15\pi = \frac{1}{3}\pi(9)h = 3\pi h$, so $h = 5$. Skipping the $\frac{1}{3}$ gives $h = \frac{15}{9} = \frac{5}{3}$.
8. **B** - $V = \frac{4}{3}(3.14)(8) = \frac{100.48}{3} \approx 33.49$. Squaring the radius instead of cubing gives 16.75; using $4(3.14)(8)$ without dividing by 3 gives 100.48.
9. **C** - $V = 3.14 \cdot 16 \cdot 20 = 1004.8$. Using the diameter 8 as the radius gives 4,019.2; including a factor of $\frac{1}{3}$ gives about 334.9.
10. **B** - The cylinder holds 3 times as much as the cone: $3 \cdot 24\pi = 72\pi$. Dividing by 3 instead gives 8π .

Remember:

- Standard 8.G.C.9: know and use the volume formulas for cylinders, cones and spheres to solve real-world problems.
- Cylinder: $V = \pi r^2 h$. Cone: $V = \frac{1}{3}\pi r^2 h$. Sphere: $V = \frac{4}{3}\pi r^3$.
- A cone has exactly one third of the volume of a cylinder with the same radius and height.
- A diameter must be halved to get the radius before using any formula.
- Volume is measured in cubic units; leave π in exact answers or use 3.14 for a decimal estimate.