

Geometry - Area, Volume and Dissection Arguments - Quiz

Common Core G-GMD.A.1, G-GMD.A.3 · maths-pdf.fr/en/

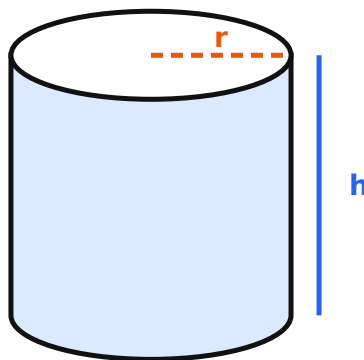
Name: _____ Class: _____ Date: ____/____/____

Test your understanding of circles and volume formulas with this 10-question multiple-choice quiz. Each question has one correct answer, and the explanation after it names the typical mistake behind the wrong choices. Take it after the lesson or before the test.

Geometry · Common Core State Standards: **G-GMD.A.1, G-GMD.A.3**

Questions

Question 1



Cylinder: $V = \pi r^2 h$.

A cylinder has radius 2 and height 5. What is its volume?

- A. 10 pi
- B. 100 pi
- C. 4 pi
- D. 20 pi

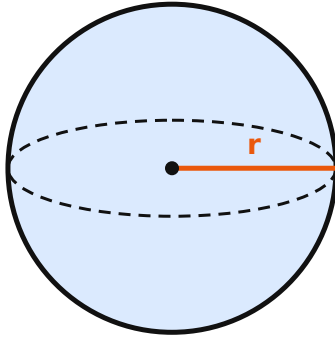
Question 2

A cone and a cylinder have the same base and height. The cylinder's volume is 90. What is the cone's volume?

- A. 45

- B. 30
- C. 270
- D. 60

Question 3



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

A sphere has radius 3. What is its volume?

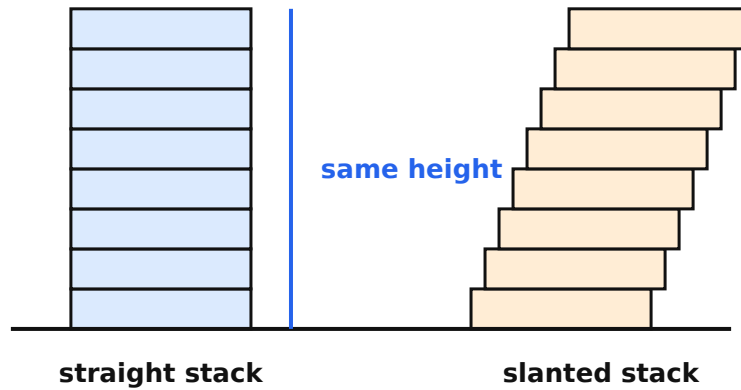
- A. 36 pi
- B. 12 pi
- C. 9 pi
- D. 108 pi

Question 4

The area of a circle with diameter 12 is

- A. 144 pi
- B. 12 pi
- C. 72 pi
- D. 36 pi

Question 5



Cavalieri's principle: equal heights and equal cross-sections give equal volumes.

Two stacks have the same height and the same cross-section. Which is true?

- A. The straight stack has more volume
- B. They have the same volume
- C. The slanted stack has more volume
- D. The volumes cannot be compared

Question 6

A square pyramid has base side 6 and height 5. What is its volume?

- A. 180
- B. 60
- C. 30
- D. 90

Question 7

If the radius of a cylinder doubles and the height stays the same, the volume

- A. Becomes 4 times as large
- B. Doubles
- C. Becomes 8 times as large
- D. Stays the same

Question 8

How many congruent pyramids fit in the cube that has the same base and height?

- A. 3
- B. 2
- C. 4
- D. 6

Question 9

What is the volume of a hemisphere with radius 3?

- A. 36π
- B. 9π
- C. 18π
- D. 54π

Question 10

A cone has radius 3 and slant height 5. What is its height?

- A. 8
- B. 2
- C. 4
- D. 34

Answers

1. **D** - $V = \pi \times 2^2 \times 5 = 20\pi$. Using the diameter would give 100π .
2. **B** - The cone is one third: $90 / 3 = 30$.
3. **A** - $(4/3)\pi(27) = 36\pi$. The value 108π forgets the $1/3$.
4. **D** - The radius is 6, so the area is 36π . Using 12 as the radius gives 144π .
5. **B** - Cavalieri's principle: equal heights and equal cross-sectional areas mean equal volumes.
6. **B** - $V = (1/3)(36)(5) = 60$. The value 180 is the prism volume.
7. **A** - V depends on r squared, so doubling r multiplies V by 4.
8. **A** - A cube can be cut into three congruent pyramids, so each pyramid is one third of the cube.
9. **C** - Half of the sphere: $36\pi / 2 = 18\pi$.
10. **C** - The height is the square root of $25 - 9 = 4$.

Remember

- Circle: $C = 2\pi r$, $A = \pi r^2$.
- Prism and cylinder: $V = Bh$.
- Pyramid and cone: $V = (1/3)Bh$.
- Sphere: $V = (4/3)\pi r^3$.
- Cavalieri's principle: same height and same cross-sectional areas give the same volume.