Geometry Challenge

Use this key to check answers and read the explanations.

1. An angle measures exactly 90 degrees. How should it be classified?
   - A. Right
   - B. Acute
   - C. Obtuse
   - D. Straight

   Correct answer: A. Right
   A right angle measures 90 degrees. Acute angles are smaller, and obtuse angles lie between 90 and 180 degrees.

2. How long is the perimeter of a square with side length 7 cm?
   - A. 21 cm
   - B. 14 cm
   - C. 28 cm
   - D. 49 cm

   Correct answer: C. 28 cm
   All four sides have length 7 cm. Adding them gives 28 cm.

3. A rectangle covers a width of 6 meters and a length of 11 meters. What is its area?
   - A. 17 square meters
   - B. 66 square meters
   - C. 34 square meters
   - D. 72 square meters

   Correct answer: B. 66 square meters
   Multiply the length and width to find the area, 11 × 6 = 66 square meters.

4. A circle has a radius of 8 cm. What is its diameter?
   - A. 24 cm
   - B. 4 cm
   - C. 8 cm
   - D. 16 cm

   Correct answer: D. 16 cm
   A diameter goes through the center from one side to the other, so it is twice the radius.

5. Which point lies on the vertical axis?

A. (5, 0)
B. (0, −5)
C. (−5, 4)
D. (4, 5)

Correct answer: B. (0, −5)
The vertical axis is the y-axis. Every point on it has an x-coordinate of zero.

6. Two angles of a plane triangle measure 44° and 67°. What is the third angle?

A. 69°
B. 67°
C. 79°
D. 111°

Correct answer: A. 69°
Angles in a plane triangle add to 180°. Subtract 44° and 67° to find 69°.

7. What is the area of a triangle with base 14 cm and perpendicular height 9 cm?

A. 126 square centimeters
B. 46 square centimeters
C. 108 square centimeters
D. 63 square centimeters

Correct answer: D. 63 square centimeters
The area is half the base times the perpendicular height, so take half of 126.

8. What is the exact circumference of a circle with diameter 13 cm?

A. 26π cm
B. 6.5π cm
C. 13π cm
D. 169π cm

Correct answer: C. 13π cm
Circumference equals π times the diameter, which gives 13π cm.

9. A box measures 12 cm by 5 cm by 4 cm inside. What is its internal volume?

A. 240 cubic centimeters
B. 120 cubic centimeters
C. 196 cubic centimeters
D. 248 cubic centimeters

Correct answer: A. 240 cubic centimeters
Multiply the three interior dimensions. The result is 12 × 5 × 4 = 240 cubic centimeters.

10. The two shorter sides of a right triangle are 8 m and 15 m. How long is its hypotenuse?

A. 23 m
B. 19 m
C. 21 m
D. 17 m

Correct answer: D. 17 m
The squared length is $8^2 + 15^2 = 64 + 225 = 289$. The positive square root is 17.

11. A 12 by 9 meter rectangular floor loses a 4 by 3 meter rectangular corner. What is the remaining area?

A. 102 square meters
B. 90 square meters
C. 96 square meters
D. 120 square meters

Correct answer: C. 96 square meters
Subtract the missing area's 12 square meters from the original rectangle's 108.

12. A rectangle's length is triple its width. If the perimeter is 48 cm, what is the area?

A. 72 square centimeters
B. 108 square centimeters
C. 96 square centimeters
D. 144 square centimeters

Correct answer: B. 108 square centimeters
Two lengths and two widths total eight widths, so the width is 6 and the length is 18. Their product is 108.

13. A rectangular garden's corners include $(-2, 1)$, $(-2, 6)$ and $(4, 6)$. If each grid unit represents 1 meter, what is the garden's area?

A. 36 square meters
B. 11 square meters
C. 22 square meters
D. 30 square meters

Correct answer: D. 30 square meters
The vertical side has length $6 - 1 = 5$. The horizontal side has length $4 - (-2) = 6$. Multiply to get 30.

14. A cube has the same volume as a rectangular box measuring 2 cm by 4 cm by 8 cm. How long is a cube edge?

A. 4 cm
B. 6 cm
C. 8 cm
D. 16 cm

Correct answer: A. 4 cm
The box holds 2 × 4 × 8 = 64 cubic centimeters. A cube with three 4 cm dimensions has that same volume.

15. A 24 m by 10 m courtyard needs a path along its diagonal. Each package covers 4 m of path. What is the smallest number of packages that covers the entire diagonal?

A. 8
B. 6
C. 7
D. 9

Correct answer: C. 7
The diagonal is $\sqrt{(24^2 + 10^2)} = 26$ m. Six packages cover only 24 m, while seven cover 28 m.