

The square of 0.01 is $(0.01)^2 = 0.01 \times 0.01 = 0.0001$.

12. What is the approximate value of $(9.9)^2$?

(1)

- A. 81 B. 121
C. 144 D. ✓ 100

Answer: D

Since 9.9 is very close to 10, the value of $(9.9)^2$ is approximately $10^2 = 100$.

13. If $(4.56)^2 = 20.79$, then $(0.456)^2$ is _____.

(1)

- A. ✓ 0.2079 B. 207.9
C. 2079 D. 2.079

Answer: A

Since $0.456 = 4.56 \times 10^{-1}$, its square is $(0.456)^2 = (4.56)^2 \times 10^{-2} = 20.79 \times 0.01 = 0.2079$.

14. Which one of the following is not a perfect square?

(1)

- A. 169
C. 196
B. ✓ 125
D. 121

Answer: B

The numbers $169 = 13^2$, $196 = 14^2$, and $121 = 11^2$ are all perfect squares, whereas $125 = 5^3$ is a perfect cube but not a perfect square.

15. Which one of the following is not a perfect cube number?

(1)

- A. 512
C. ✓ 252
- B. 125
D. 343

Answer: C

The numbers $512 = 8^3$, $125 = 5^3$, and $343 = 7^3$ are all perfect cubes, while 252 is not.

16. Which one of the following is the cube root of 0.008?

(1)

- A. 0.002
B. 0.02
C. ✓ 0.2
D. 2

Answer: C

Since $0.2 \times 0.2 \times 0.2 = 0.008$, the cube root of 0.008 is 0.2.

17. Which one of the following is equal to the cube of $\frac{3}{5}$?

(1)

- A. $\checkmark \frac{27}{125}$ B. $\frac{9}{25}$
C. $\frac{9}{15}$ D. $\frac{6}{10}$

Answer: A

The cube of $\frac{3}{5}$ is calculated as $(\frac{3}{5})^3 = \frac{3^3}{5^3} = \frac{27}{125}$.

18. Which one of the following is true about $a = b^3$?

(1)

- A. b is the cube of a B. a is the cube root of b
C. Both are correct D. ✓ **None are correct**

Answer: D

From $a = b^3$, it follows that a is the cube of b and b is the cube root of a . Since options A and B state the exact opposite relationships, neither is correct, making D the right choice.

19. What is the value of x in the equation $\sqrt[3]{4x+3} = 3$? (1)

- A. 9
B. ✓ 6
C. 27
D. 24

Answer: B

Cubing both sides of the equation gives $4x + 3 = 3^3 = 27$. Solving for x yields $4x = 24$, which simplifies to $x = 6$.

20. What is the length of the side of a square whose area is 441 cm^2 ? (1)

- A. ✓ 21 cm
B. 22 cm
C. 20 cm
D. 12 cm

Answer: A

The area of a square is given by $A = s^2$, where s is the side length. Solving $s^2 = 441 \text{ cm}^2$ gives $s = \sqrt{441} = 21 \text{ cm}$.

21. If the volume of a cube is 216 cm^3 , then what is the length of the edge of the cube? (1)

- A. ✓ 6 cm
B. 5 cm
C. 7 cm
D. 8 cm

Answer: A

The volume of a cube is given by $V = e^3$, where e is the edge length. Since $e^3 = 216$, taking the cube root of both sides gives $e = \sqrt[3]{216} = 6 \text{ cm}$.

22. If point $P(x, y)$ lies in the IV quadrant, then which one of the following is true about the coordinates of x and y ? (1)

- A. ✓ $x > 0$ and $y < 0$
B. $x > 0$ and $y > 0$
C. $x < 0$ and $y < 0$
D. $x < 0$ and $y > 0$

Answer: A

The Cartesian plane is divided into four quadrants; in Quadrant IV, the x-coordinates are positive ($x > 0$) and the y-coordinates are negative ($y < 0$).

23. Which one of the following equations represents a horizontal line? (1)

- A. $y = -3x + 2$
B. $y = 3x$
C. ✓ $2y + 4 = 6$
D. $\frac{1}{2}x = 4$

Answer: C

A horizontal line has the equation form $y = c$, where c is a constant. Simplifying $2y + 4 = 6$ gives $2y = 2$, which simplifies to $y = 1$, representing a horizontal line.

24. Which one of the following is not true about the equation $y = -2x - 3$? (1)

- A. The y-intercept is -3 .
B. ✓ The graph passes through the origin.
C. The slope is -2 .
D. The graph touches quadrants II and IV.

Answer: B

A line passes through the origin if and only if its y-intercept is 0. The given line $y = -2x - 3$ has a y-intercept of -3 , meaning it does not pass through the origin.

- 25.** If point $P(3, 2)$ lies on the line $ax + 2y = 10$, then what is the value of a ? (1)
- A. ✓ 2 B. 3
C. $\frac{4}{3}$ D. $\frac{10}{7}$

Answer: A

Substituting the coordinates of the point $P(3, 2)$ into the line equation gives $a(3) + 2(2) = 10$, which simplifies to $3a + 4 = 10$, and solving for a yields $a = 2$.

- 26.** Which one of the following is not equivalent to $10x - 6 = 5x + 4$? (1)
- A. $5x = 10$
- B. $10x = 20$
- C. $8x - 2 = 14$
- D. ✓ $6x + 2 = 12$

Answer: D

The original equation $10x - 6 = 5x + 4$ simplifies to $5x = 10$, which has the unique solution $x = 2$. Option D simplifies to $6x = 10$, which yields $x = 5/3$ and is therefore not equivalent.

- 27.** A man is 28 years older than his son. Ten years ago, he was three times as old as his son. What is the present age of the man? (1)
- A. 14 B. 30
- C. 24 D. ✓ 52

Answer: D

Letting the son's age be S , the man's age is $S + 28$. Ten years ago, $(S + 28) - 10 = 3(S - 10)$, which solves to $S = 24$, making the man's present age $24 + 28 = 52$ years.

- 28.** Three-fourths of a number is greater than 12. The mathematical expression for this sentence is: (1)
- A. $\frac{4}{3} > 12a$ B. $\checkmark \frac{3}{4}a > 12$
C. $\frac{3}{4} > 12a$ D. $\frac{4}{3}a > 12$

Answer: B

Three-fourths of a number a is written mathematically as $\frac{3}{4}a$, and 'is greater than 12' translates to the inequality sign $>$.

— END OF MARKING KEY —