Linear Equations with Two Variables (Test 1)

1. Which of the following equations is a linear equation in two variables?

A) $2x^2 + 3y = 7$

B) $4x - 5y = 12$

C) $xy + 2x = 9$

D) $\frac{3}{x} + y = 5$

2. Which ordered pair is a solution to the linear equation $3x - 2y = 10$?

A) $(2, 2)$

B) $(4, -1)$

C) $(2, -2)$

D) $(0, 5)$

3. What is the y-intercept of the line represented by the equation $4x + 2y = 12$?

A) $(0, 6)$

B) $(6, 0)$

C) $(0, 3)$

D) $(3, 0)$

4. What is the x-intercept of the linear equation $5x - 3y = 15$?

A) $(0, -5)$

B) $(-5, 0)$

C) $(0, 3)$

D) $(3, 0)$

5. Convert the equation $6x - 3y = 9$ into slope-intercept form ($y = mx + b$).

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A) $y = 2x - 3$

B) $y = -2x + 3$

C) $y = 2x + 3$

D) $y = -2x - 3$

6. What is the slope of the line passing through the points $(2, 5)$ and $(4, 11)$?

A) $\frac{1}{3}$

B) 3

C) 2

D) -3

7. If the point $(k, 4)$ lies on the graph of the equation $2x + 3y = 18$, what is the value of k?

A) 2

B) 3

C) 6

D) 15

8. Which of the following equations represents a horizontal line passing through the point $(5, -2)$?

A) $x = 5$

B) $y = 5$

C) $x = -2$

D) $y = -2$

9. What is the slope of a line that is parallel to the line $y = -\frac{3}{4}x + 7$?

A) $\frac{4}{3}$

B) $-\frac{4}{3}$

C) $-\frac{3}{4}$

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D) $\frac{3}{4}$

10. How many solutions does a single linear equation in two variables (such as $x + y = 8$) have?

A) Exactly one solution

B) Exactly two solutions

C) No solutions

D) Infinitely many solutions

11. Which equation represents a line with a slope of (-2) that passes through the point $(1, 4)$?

A) $y = -2x + 6$

B) $y = -2x + 4$

C) $y = -2x + 2$

D) $y = -2x - 2$

12. Rewrite the equation $y = \frac{2}{3}x - 4$ in standard form ($Ax + By = C$, where A, B, and C are integers and $A \geq 0$).

A) $2x - 3y = 12$

B) $2x + 3y = 12$

C) $2x - 3y = -12$

D) $-2x + 3y = -12$

13. Which quadrant does the point $(-3, 5)$ lie in, and is it a solution to $x + y = 2$?

A) Quadrant I; Yes

B) Quadrant II; Yes

C) Quadrant II; No

D) Quadrant IV; Yes

14. What is the slope of the line represented by the equation $x = -7$?

A) 0

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B) -7

C) 1

D) Undefined

Answer Key & Explanations

1. **B** — A linear equation in two variables has the form $Ax + By = C$, where the variables have an exponent of 1 and are not multiplied together or in a denominator.
2. **C** — Substituting $(2, -2)$ into the equation gives $3(2) - 2(-2) = 6 + 4 = 10$.
3. **A** — Set $x = 0$: $4(0) + 2y = 12 \implies 2y = 12 \implies y = 6$. The y-intercept is $(0, 6)$.
4. **D** — Set $y = 0$: $5x - 3(0) = 15 \implies 5x = 15 \implies x = 3$. The x-intercept is $(3, 0)$.
5. **A** — Subtract $6x$ from both sides: $-3y = -6x + 9$. Divide by -3: $y = 2x - 3$.
6. **B** — Using $m = \frac{y_2 - y_1}{x_2 - x_1}$: $m = \frac{11-5}{4-2} = \frac{6}{2} = 3$.
7. **B** — Substitute $x = k$ and $y = 4$: $2k + 3(4) = 18 \implies 2k + 12 = 18 \implies 2k = 6 \implies k = 3$.
8. **D** — Horizontal lines have the equation $y = c$. Since it passes through $(5, -2)$, $y = -2$.
9. **C** — Parallel lines have identical slopes. The slope of the given line is $-\frac{3}{4}$.
10. **D** — Every point on the graphed line represents a valid (x, y) pair, giving infinitely many solutions.
11. **A** — Use point-slope form: $y - 4 = -2(x - 1) \implies y - 4 = -2x + 2 \implies y = -2x + 6$.
12. **B** — Multiply the price of muffins by x and cookies by y, then add them to equal the total cost: $2x + 1.50y = 18$.
13. **A** — Multiply the entire equation by 3: $3y = 2x - 12$. Rearrange to get $2x - 3y = 12$.
14. **B** — Negative x and positive y places the point in Quadrant II. Substituting into the equation: $-3 + 5 = 2$, so it is a solution.
15. **D** — The equation $x = -7$ represents a vertical line, and all vertical lines have an undefined slope.

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