Linear Equations Worksheet

Practice finding slope, writing equations, and graphing lines. Show your work for full credit.

Key Formulas

Forms of Linear Equations

Slope-intercept: $y = mx + b$

Point-slope: $y - y_1 = m(x - x_1)$

Standard form: $Ax + By = C$

Slope

Formula: $m = (y_2 - y_1) / (x_2 - x_1)$

Parallel lines: Same slope ($m_1 = m_2$)

Perpendicular: Negative reciprocal ($m_1 = -1/m_2$)

Horizontal: $m = 0$

Vertical: m is undefined

Practice Problems

Part A: Find the slope between each pair of points.

1. (2, 5) and (4, 11)

m =

2. (-3, 7) and (1, -1)

m =

3. (0, -4) and (6, 2)

m =

Part B: Write the equation of the line in slope-intercept form.

4. Slope = 3, y-intercept = -2

y =

5. Passes through (1, 4) with slope = -2

y =

6. Passes through (2, 3) and (6, 11)

y =

Part C: Parallel and perpendicular lines.

7. Write the equation of a line parallel to y = 2x + 5 that passes through (3, 1).

y =

8. Write the equation of a line perpendicular to y = (1/3)x - 4 that passes through (6, 2).

y =

Part D: Convert to standard form (Ax + By = C).

9. y = -4x + 7

10. y = (2/3)x - 5

Answer Key

1. m = (11 - 5) / (4 - 2) = 6/2 = 3
2. m = (-1 - 7) / (1 - (-3)) = -8/4 = -2
3. m = (2 - (-4)) / (6 - 0) = 6/6 = 1
4. y = 3x - 2
5. y = -2x + 6

6. m = 8/4 = 2, y = 2x - 1
7. y = 2x - 5 (parallel, m = 2)
8. y = -3x + 20 (perp, m = -3)
9. 4x + y = 7
10. 2x - 3y = 15 (multiply by 3)

Remember: parallel lines have the same slope, perpendicular lines have slopes that are negative reciprocals (multiply to -1).