

Practice 3-5

Lines in the Coordinate Plane

Write an equation of the line with the given slope that contains the given point.

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| 1. $F(3, -6)$, slope $\frac{1}{3}$ | 2. $Q(5, 2)$, slope -2 | 3. $A(3, 3)$, slope 7 | 4. $B(-4, -1)$, slope $-\frac{1}{2}$ |
| 5. $L(-3, -2)$, slope $\frac{1}{6}$ | 6. $R(15, 10)$, slope $\frac{4}{5}$ | 7. $D(1, -9)$, slope 4 | 8. $W(0, 6)$, slope -1 |

Graph each line using slope-intercept form.

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|------------------|------------------------------|----------------------------|---------------------------------------|
| 9. $2y = 8x - 2$ | 10. $2y = \frac{1}{2}x - 10$ | 11. $3x + 9y = 18$ | 12. $-x + y = -1$ |
| 13. $y + 7 = 2x$ | 14. $4x - 2y = 6$ | 15. $5 - y = \frac{3}{4}x$ | 16. $\frac{1}{3}x = \frac{1}{2}y - 1$ |

Graph each line.

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|------------------|----------------------------|-----------------------------|---------------|
| 17. $y = 5x + 4$ | 18. $y = \frac{1}{2}x - 3$ | 19. $x = -2$ | 20. $y = -2x$ |
| 21. $y = -5$ | 22. $y = x$ | 23. $y = -\frac{2}{3}x + 2$ | 24. $x = 2.5$ |

Write an equation of the line containing the given points.

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| 25. $A(2, 7), B(3, 4)$ | 26. $P(-1, 3), Q(0, 4)$ | 27. $S(10, 2), T(2, -2)$ | 28. $D(7, -4), E(-5, 2)$ |
| 29. $G(-2, 0), H(3, 10)$ | 30. $B(3, 5), C(-6, 2)$ | 31. $X(-1, -1), Y(4, -2)$ | 32. $M(8, -3), N(7, 3)$ |

Write equations for (a) the horizontal line and (b) the vertical line that contain the given point.

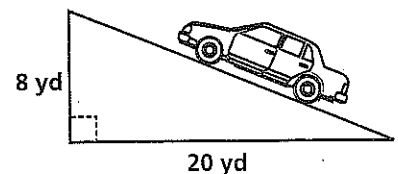
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|-----------------|---------------|-----------------|----------------|
| 33. $Z(2, -11)$ | 34. $D(0, 2)$ | 35. $R(-4, -4)$ | 36. $F(-1, 8)$ |
|-----------------|---------------|-----------------|----------------|

Graph each line using intercepts.

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| 37. $3x - y = 12$ | 38. $2x + 4y = -4$ | 39. $\frac{1}{2}x + \frac{1}{2}y = 3$ | 40. $12x - 3y = -6$ |
| 41. $2x - 2y = 8$ | 42. $\frac{1}{4}x + 2y = 2$ | 43. $-6x + 1.5y = 18$ | 44. $0.2x + 0.3y = 1.8$ |

45. **Hourly Wages** The equation $P = \$3.90 + \$0.10x$ represents the hourly pay (P) a worker receives for loading x number of boxes onto a truck.
- What is the slope of the line represented by the given equation?
 - What does the slope represent in this situation?
 - What is the y -intercept of the line?
 - What does the y -intercept represent in this situation?

46. **Inclines** The Blackberrys' driveway is difficult to get up in the winter ice and snow because of its slope. What is the equation of the line that represents the Blackberrys' driveway?



Reteaching 3-5

Lines in the Coordinate Plane

OBJECTIVE: Writing and graphing equations of lines

MATERIALS: Graphing paper

If you know two points on a line, or if you know one point and the slope of a line, then you can find the equation of the line.

Example

Write an equation of the line that contains the points $J(4, -5)$ and $K(-2, 1)$. Graph the line.

If you know two points on a line, first find the slope using $m = \frac{y_2 - y_1}{x_2 - x_1}$.

$$m = \frac{1 - (-5)}{-2 - 4} = \frac{6}{-6} = -1$$

Now you know two points and the slope of the line. Select one of the points to substitute for (x_1, y_1) . Then find the equation using the point-slope form $y - y_1 = m(x - x_1)$.

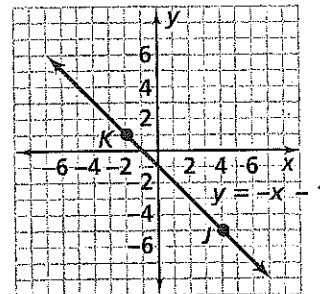
$$y - 1 = -1(x - (-2)) \quad \text{Substitute.}$$

$$y - 1 = -1(x + 2) \quad \text{Simplify within parentheses. You may leave your equation in this form or further simplify to find the slope-intercept form.}$$

$$y - 1 = -x - 2$$

$$y = -x - 1$$

Answer: Either $y - 1 = -1(x + 2)$ or $y = -x - 1$ is acceptable.



Exercises

Write an equation for the line with the given slope that contains the given point. Graph each line.

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| 1. slope 2, (2, -2) | 2. slope $\frac{1}{3}$, (-6, -2) | 3. slope -1, (-3, 0) |
| 4. slope $\frac{5}{6}$, (-6, -3) | 5. slope $-\frac{1}{2}$, (-4, 3) | 6. slope 0, (3, 1) |

Write an equation for the line containing the given points. Graph each line.

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| 7. (2, 3), (4, -4) | 8. (-4, 5), (3, -2) | 9. (0, 1), (-5, -1) |
| 10. (1, 1), (6, 1) | 11. (-3, 0), (-5, 4) | 12. (-3, 4), (-3, -1) |

Write an equation for the line with the given information. Graph each line.

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| 13. contains point (4, -2), slope -3 | 14. contains points (3, -1), (5, 5) | 15. contains point (2, 1), slope $\frac{1}{4}$ |
| 16. contains point (8, -2), slope $-\frac{3}{4}$ | 17. contains points (-4, 5), (-3, 4) | 18. contains points (1, 1), (2, 1) |