6.4 Point-Slope Form and Writing Linear Equations

Algebra I

Name KEY

Period

Slope-Intercept Form: $y = mx + b$

Slope Formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$

* Point-Slope Form: $y - y_1 = m(x - x_1)$

Write an equation of the line that passes through the given point and has the given slope.

1. (3, 5), m = 0

x_1, y_1

$* y - 5 = 0(x - 3)$

$y - 5 = 0$

$+5 \quad +5$

$y = 5$

2. (-5, 1), $m = -\frac{2}{5}$

x_1, y_1

$* y - 1 = -\frac{2}{5}(x + 5)$

$y - 1 = -\frac{2}{5}x - 2$

$+1 \quad +1$

$y = -\frac{2}{5}x - 1$

3. (2, 2), m = -1

x_1, y_1

$* y - 2 = -1(x - 2)$

$y - 2 = -x + 2$

$+2 \quad +2$

$y = -x + 4$

4. (4, 2), $m = \frac{5}{4}$

x_1, y_1

$* y - 2 = \frac{5}{4}(x - 4)$

$y - 2 = \frac{5}{4}x - 5$

$+2 \quad +2$

$y = \frac{5}{4}x - 3$

5. (2, -1), m = 1

x_1, y_1

$* y + 1 = 1(x - 2)$

$y + 1 = x - 2$

$-1 \quad -1$

$y = x - 3$

6. (-1, 2), m = -4

x_1, y_1

$* y - 2 = -4(x + 1)$

$y - 2 = -4x - 4$

$+2 \quad +2$

$y = -4x - 2$

Point-Slope $\Rightarrow y - y_1 = m(x - x_1)$

6.4 NOTES

7. (-1, -1), m = -2

$x_1\ y_1$

$*y + 1 = -2(x + 1)$

$y + 1 = -2x - 2$

$-1 \qquad -1$

$y = -2x - 3$

8. (5, 5), $m = \frac{7}{5}$

$x_1\ y_1$

$*y - 5 = \frac{7}{5}(x - 5)$

$y - 5 = \frac{7}{5}x - 7$

$+5 \qquad +5$

$y = \frac{7}{5}x - 2$

9. (4, -4), $m = -\frac{3}{2}$

$x_1\ y_1$

$*y + 4 = -\frac{3}{2}(x - 4)$

$y + 4 = -\frac{3}{2}x + 6$

$-4 \qquad +4$

$y = -\frac{3}{2}x + 10$

10. (-3, -2), m = 2

$x_1\ y_1$

$*y + 2 = 2(x + 3)$

$y + 2 = 2x + 6$

$-2 \qquad -2$

$y = 2x + 4$

11. (4, 3), $m = \frac{1}{2}$

$x_1\ y_1$

$*y - 3 = \frac{1}{2}(x - 4)$

$y - 3 = \frac{1}{2}x - 2$

$+3 \qquad +3$

$y = \frac{1}{2}x + 1$

12. (-5, -5), $m = \frac{9}{5}$

$x_1\ y_1$

$*y + 5 = \frac{9}{5}(x + 5)$

$y + 5 = \frac{9}{5}x + 9$

$-5 \qquad -5$

$y = \frac{9}{5}x + 4$

13. (1, -5), $m = -\frac{3}{2}$

$x_1\ y_1$

$*y + 5 = -\frac{3}{2}(x - 1)$

$y + 5 = -\frac{3}{2}x + \frac{3}{2}$

$-5 \qquad -5$

$y = -\frac{3}{2}x - \frac{7}{2}$

14. (-5, 4), m = undefinded

*Vertical line goes through x-axis.

$x = -5$