

5-5 Study Guide and Intervention

Writing Equations in Point-Slope Form

Point-Slope Form

Point-Slope Form	$y - y_1 = m(x - x_1)$, where (x_1, y_1) is a given point on a nonvertical line and m is the slope of the line
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Example 1 Write the point-slope form of an equation for a line that passes through $(6, 1)$ and has a slope of $-\frac{5}{2}$.

$$y - y_1 = m(x - x_1) \quad \text{Point-slope form}$$

$$y - 1 = -\frac{5}{2}(x - 6) \quad m = -\frac{5}{2}; (x_1, y_1) = (6, 1)$$

Therefore, the equation is $y - 1 = -\frac{5}{2}(x - 6)$.

Example 2 Write the point-slope form of an equation for a horizontal line that passes through $(4, -1)$.

$$y - y_1 = m(x - x_1) \quad \text{Point-slope form}$$

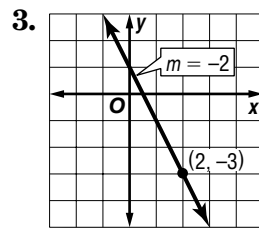
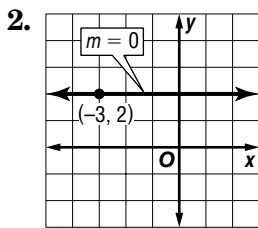
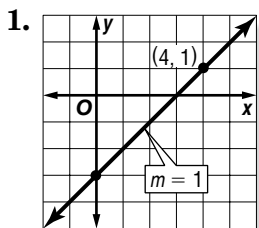
$$y - (-1) = 0(x - 4) \quad m = 0; (x_1, y_1) = (4, -1)$$

$$y + 1 = 0 \quad \text{Simplify.}$$

Therefore, the equation is $y + 1 = 0$.

Exercises

Write the point-slope form of an equation for a line that passes through each point with the given slope.



4. $(2, 1), m = 4$

5. $(-7, 2), m = 6$

6. $(8, 3), m = 1$

7. $(-6, 7), m = 0$

8. $(4, 9), m = \frac{3}{4}$

9. $(-4, -5), m = -\frac{1}{2}$

10. Write the point-slope form of an equation for the horizontal line that passes through $(4, -2)$.

11. Write the point-slope form of an equation for the horizontal line that passes through $(-5, 6)$.

12. Write the point-slope form of an equation for the horizontal line that passes through $(5, 0)$.