

Section 3.5: THE POINT-SLOPE FORM OF THE EQUATION OF A LINE

When you are done with your homework you should be able to...

- π Use the point-slope form to write equations of a line
- π Find slopes and equations of parallel and perpendicular lines
- π Write linear equations that model data and make predictions

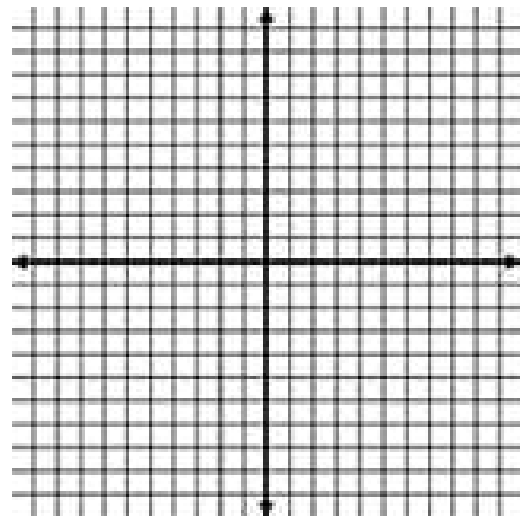
WARM-UP:

1. Simplify.

$$2 - 5[2 - (7x + 2)]$$

2. Graph the equation using the slope and y-intercept.

$$-\frac{x}{3} - \frac{y}{4} = 1$$



POINT-SLOPE FORM

We can use the _____ of a line to obtain another useful form of the line's equation. Consider a nonvertical line that has slope _____ and contains the point _____. Now let _____ represent any other _____ on the _____. Keep in mind that the point _____ is _____ and is _____ in _____ position. The point _____ is _____.

POINT-SLOPE FORM OF THE EQUATION OF A LINE

The _____ - _____ form of the _____ of a nonvertical line with slope _____ that passes through the point _____ is

Example 1: Write the point-slope form of the equation of the line with the given slope that passes through the given point.

a. $m = -2; (5, -11)$

b. $m = \frac{5}{8}; \left(\frac{1}{4}, 7\right)$

c. $m = 0; (-21, 5)$

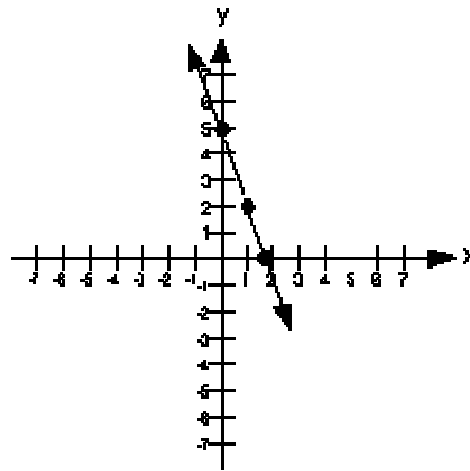
d. $m = \text{undefined}; (0, 0)$

Example 2: Use the graph to find three equations of the line in point-slope form.

1.

2.

3.



Now write the slope-intercept form:

EQUATIONS OF LINES

FORM	WHAT YOU SHOULD KNOW
Standard Form	Graph equations in this form using _____ and a _____.
$y = b$	Graph equations in this form as _____ lines with _____ as the _____.
$x = a$	Graph equations in this form as _____ lines with _____ as the _____.
Slope-Intercept Form	Graph equations in this form using the _____, _____ and the slope, _____. *Start with this form when writing a _____ equation if you know a line's _____ and _____.
Point-Slope Form	Start with this form when writing a linear equation if you know the _____ of the line and a _____ on the _____ NOT containing the _____ OR

_____ points on the line, _____
of which contains the _____.
Calculate the _____ using

PARALLEL AND PERPENDICULAR LINES

Recall that parallel lines have the _____ and
perpendicular lines have _____ which are _____
_____.

Example 3: Use the given conditions to write an equation for each line in point-slope form and slope-intercept form.

a. Passing through $(-2, -7)$ and parallel to the line whose equation is $y = -5x + 4$.

b. Passing through $(-4, 2)$ and perpendicular to the line whose equation is
 $y = -\frac{1}{3}x + 7$.

c. Passing through $(5, -9)$ and parallel to the line whose equation is $x + 7y = 12$.