

Content and Language Objective:

Students will write equations in point-slope form given two points and will be able to manipulate various situations with point-slope.

Warm-Up

1. Solve for x: $-2(3x + 6) = 4x + 5$

$$\begin{array}{r} -6x - 12 = 4x + 5 \\ -4x - 12 = 4x + 5 \end{array}$$

$$\begin{array}{r} -10x - 12 = 5 \\ +12 +12 \end{array}$$

$$\begin{array}{r} -10x = 17 \\ \hline -10 \end{array} \Rightarrow$$

2. What does the equation $3x + 2 = 5x - 8$ mean?

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Using the given information write in point-slope form, label your information and use both formats.

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

$$y - y_1 = m(x - x_1)$$

$$y + 1 = -3(x + 8)$$

$$y = y_1 + m(x - x_1)$$

$$y = -1 - 3(x + 8)$$

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Yesterday you were given a point and slope and asked to write a point-slope equation in two different formats.

What happens when you are given two points? What do you think you would do?

$(-3, 2)$ $(1, 4)$

Solve for m .

plot points on graph use a slope triangle

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

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When we are working with point-slope form we can also create an equation using two points.

In order to do this, we have to remember the slope formula.

Step 1. Find the slope using the given points.

Step 2. Pick one of the points you used for slope and plug it into the point-slope form along with the slope.

Step 3. Pick the other point you used for slope and plug it into the point-slope form along with the slope.

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Let's try to write an equation in point-slope form given two points.

x_1 y_1 x_2 y_2
(2, 4) and (-3, -5)

1. $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-5 - 4}{-3 - 2} = \frac{-9}{-5} = \frac{9}{5}$

2. $y = y_1 + m(x - x_1)$ $y = 4 + \frac{9}{5}(x - 2)$

3. $y = y_2 + m(x - x_2)$ $y = -5 + \frac{9}{5}(x + 3)$

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You try it!

x_1, y_1 x_2, y_2 $m = \frac{-2-4}{7-(-5)} = \frac{-6}{12} = -\frac{1}{2}$
(-5, 4) and (7, -2)

1. _____

2. $y = 4 - \frac{1}{2}(x + 5)$ $y - y' + m(x - x')$

3. $y = -2 - \frac{1}{2}(x - 7)$

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Look at the following equations and identify the slope and a point from the equation.

$$y = y_1 + m(x - x_1)$$

$$y - y_1 = m(x - x_1)$$

1. $y = 3 + 4(x - 5)$

$m = 4$
 $\text{point} = (5, 3)$

2. $y + 1.9 = 2(x + 3.1)$

$m = 2$
 $\text{point} = (-3.1, -1.9)$

3. $y = -3.47(x - 7) - 2$

$m = -3.47$
 $\text{point} = (7, -2)$

4. $y - 5 = -1.38(x - 2.5)$

$m = -1.38$
 $\text{point} = (2.5, 5)$

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