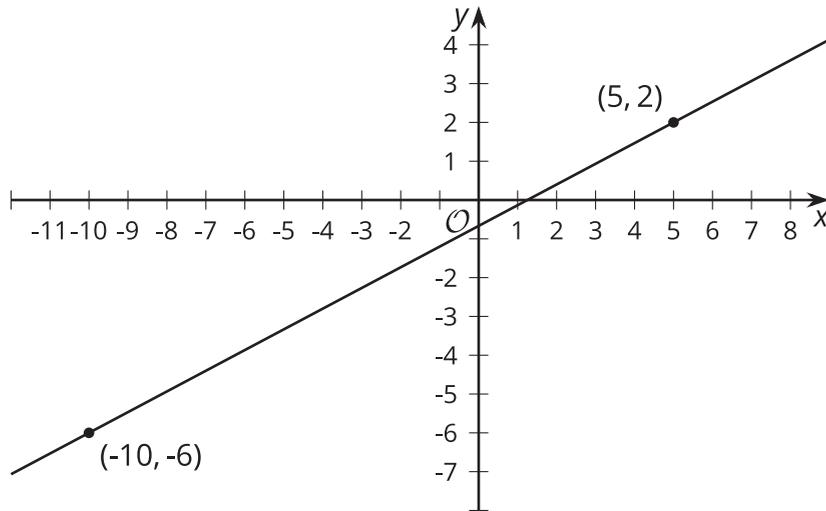# Unit 6 Lesson 9: Equations of Lines

1 Remembering Slope (Warm up)
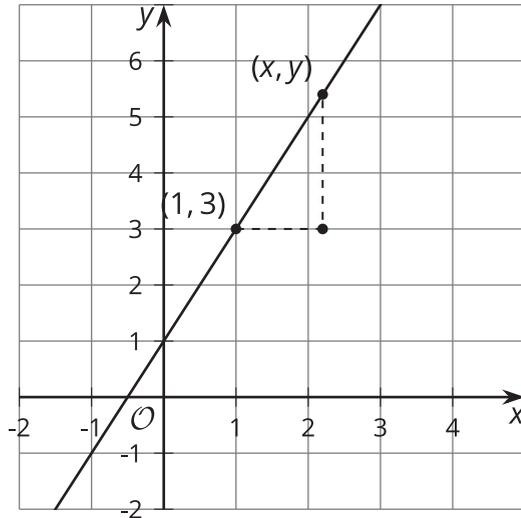
Student Task Statement

The slope of the line in the image is $\frac{8}{15}$. Explain how you know this is true.

## 2 Building an Equation for a Line

Student Task Statement

1. The image shows a line.

   a. Write an equation that says the slope between the points $(1, 3)$ and (x, y) is 2.

   b. Look at this equation: $y - 3 = 2(x - 1)$
   How does it relate to the equation you wrote?

2. Here is an equation for another line: $y - 7 = \frac{1}{2}(x - 5)$

   a. What point do you know this line passes through?

   b. What is the slope of this line?

3. Next, let's write a general equation that we can use for any line. Suppose we know a line passes through a particular point (h, k).

   a. Write an equation that says the slope between point (x, y) and (h, k) is m.

   b. Look at this equation: $y - k = m(x - h)$. How does it relate to the equation you wrote?
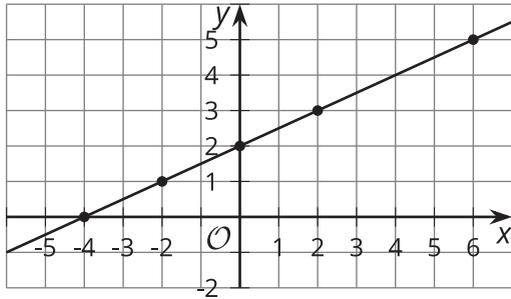
Activity Synthesis
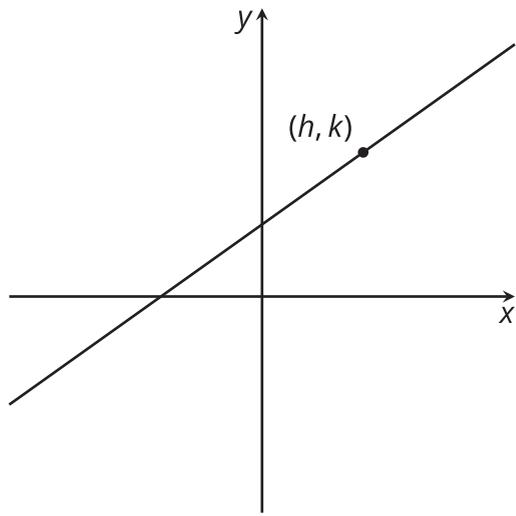
3 Using Point-Slope Form

Student Task Statement

1. Write an equation that describes each line.

   a. the line passing through point $(-2, 8)$ with slope $\frac{4}{5}$

   b. the line passing through point $(0, 7)$ with slope $-\frac{7}{3}$

   c. the line passing through point $(\frac{1}{2}, 0)$ with slope -1

   d. the line in the image

2. Using the structure of the equation, what point do you know each line passes through? What's the line's slope?

   a. $y - 5 = \frac{3}{2}(x + 4)$

   b. $y + 2 = 5x$

   c. $y = -2(x - \frac{5}{8})$

Images for Activity Synthesis