## 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.
* 
	1. Write an equation that says the slope between the points $\left(1,3\right)$ and $\left(x,y\right)$ is 2.
	2. Look at this equation: $y−3=2\left(x−1\right)$
	How does it relate to the equation you wrote?
1. Here is an equation for another line: $y−7=\frac{1}{2}\left(x−5\right)$
	1. What point do you know this line passes through?
	2. What is the slope of this line?
2. Next, let’s write a general equation that we can use for any line. Suppose we know a line passes through a particular point $\left(h,k\right)$.
	1. Write an equation that says the slope between point $\left(x,y\right)$ and $\left(h,k\right)$ is $m$.
	2. Look at this equation: $y−k=m\left(x−h\right)$. 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.
	1. the line passing through point $\left(-2,8\right)$ with slope $\frac{4}{5}$
	2. the line passing through point $\left(0,7\right)$ with slope $-\frac{7}{3}$
	3. the line passing through point $\left(\frac{1}{2},0\right)$ with slope -1
	4. 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?
	1. $y−5=\frac{3}{2}\left(x+4\right)$
	2. $y+2=5x$
	3. $y=-2\left(x−\frac{5}{8}\right)$

#### Images for Activity Synthesis





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