Chapter 6: Linear Functions

http://www.youtube.com/watch?v=tMhF-1ew_bM&feature=related

1

2

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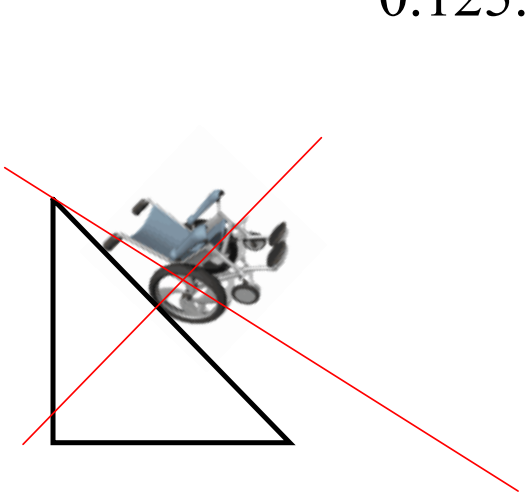
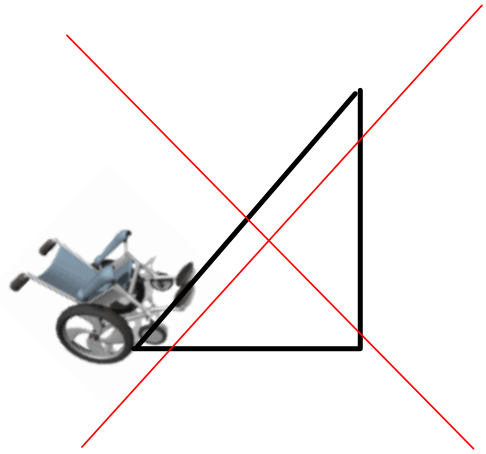
7

A wheelchair ramp should not exceed a slope of 0.125.

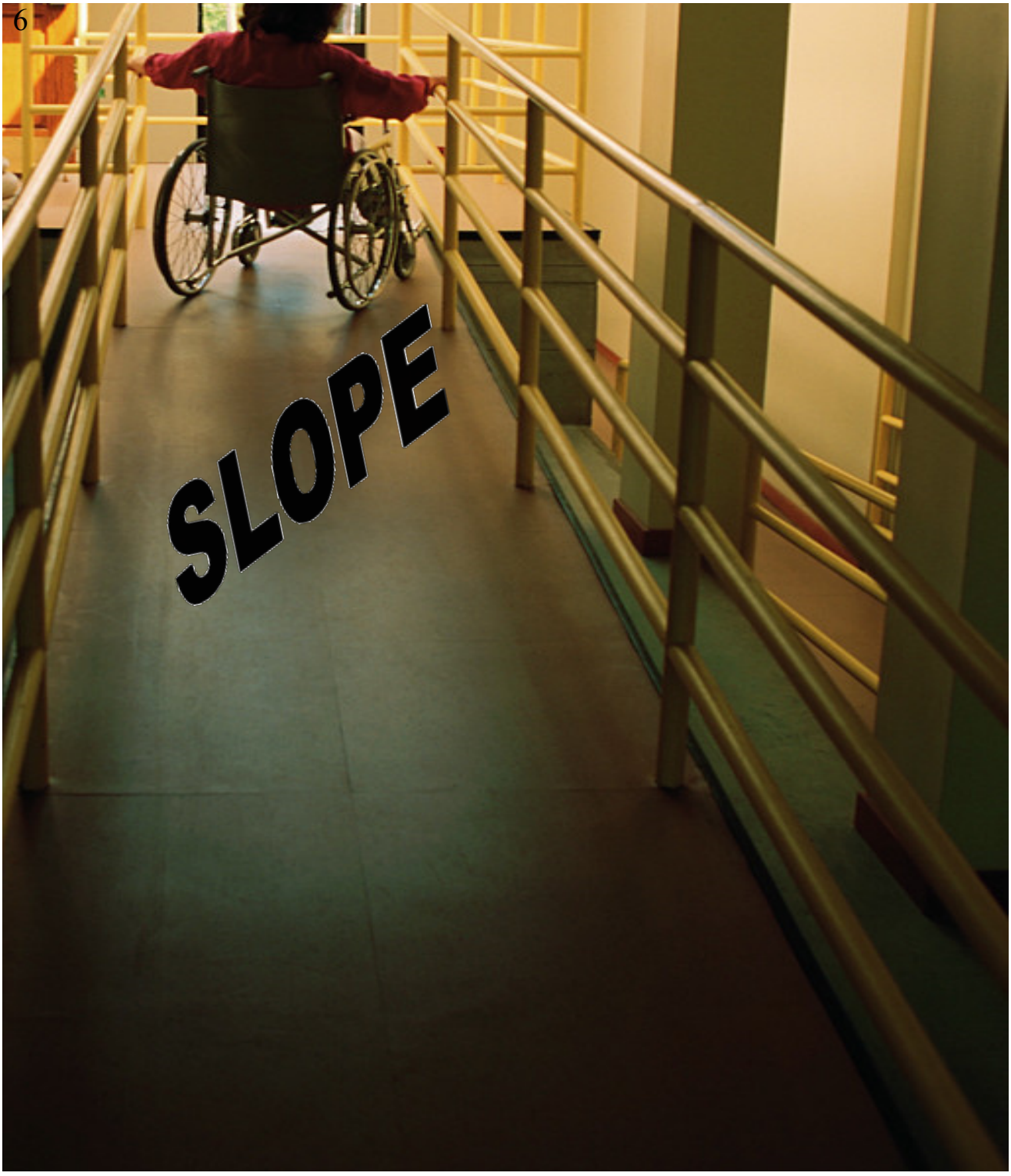




8

Building stairs should not exceed a slope of 0.83

6



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Calculating slope!

See a graph

Same as rate of change

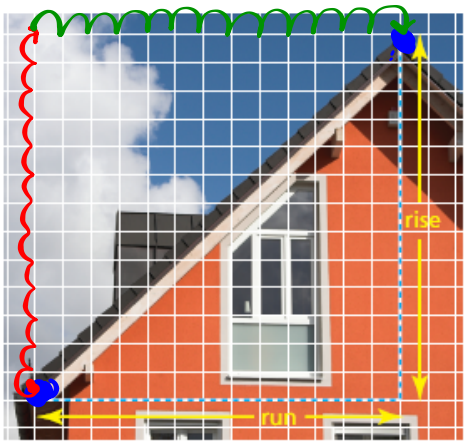
$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

Some roofs are steeper than others. Steeper roofs are more expensive to shingle.
The steepness of a roof is measured by calculating its **slope.**

$$\text{Slope} = \frac{\text{rise}}{\text{run}}$$

The **rise** is the vertical distance from the bottom of the edge of the roof to the top.
The **run** is the corresponding horizontal distance.
For each roof, we count units to determine the rise and the run.

Roof A



For Roof A

$$\text{Slope} = \frac{\text{rise}}{\text{run}} \qquad \frac{+13}{+13} = +1$$

Slope = ?

Slope intercept Equation

$y = mx + b$

slope y-intercept

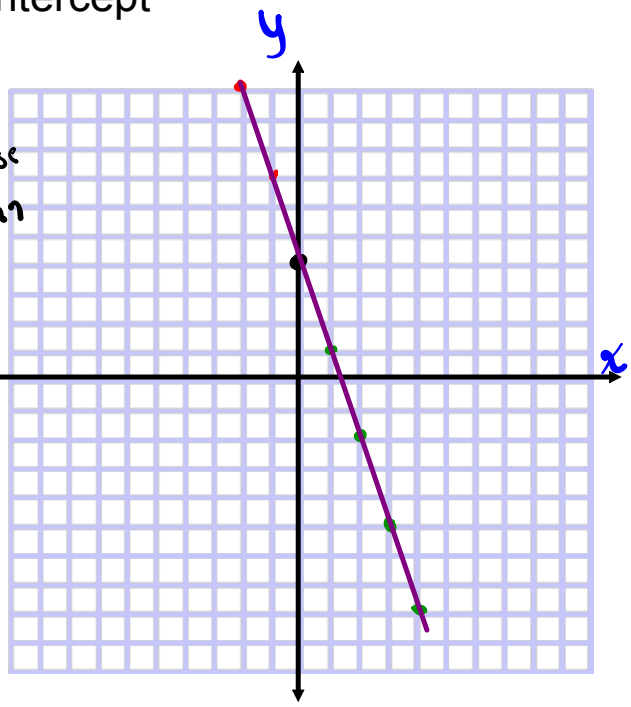
$y = mx + b$

Ex) $y = -3x + 4$

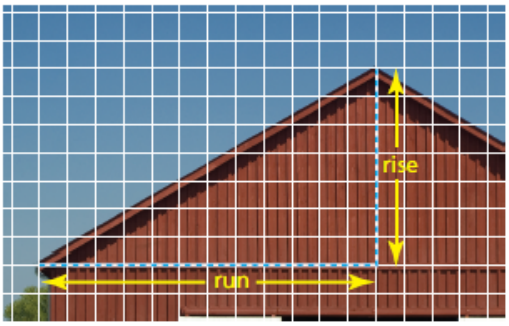
$m = -3$ same as $\frac{-3}{1}$ or $\frac{+3}{-1}$ rise / run

y-intercept = $+4$ point on y-axis

Sketch using these two pieces of information



Roof B



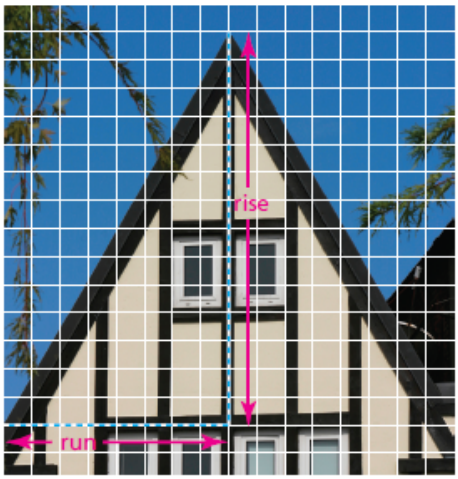
For Roof B

$$\text{Slope} = \frac{\text{rise}}{\text{run}}$$

$$\text{Slope} = \frac{7}{12}$$

$$\text{Slope} = 0.58\overline{3}$$

Roof C



For Roof C

$$\text{Slope} = \frac{\text{rise}}{\text{run}}$$

$$\text{Slope} = \frac{14}{8}$$

$$\text{Slope} = 1.75$$

Roof C is the steepest because its slope is the greatest.
Roof B is the least steep because its slope is the least.

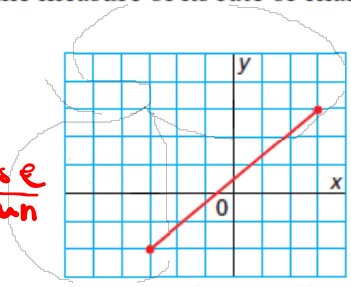
6.1 Slope of a Line

The slope of a line segment on a coordinate grid is the measure of its rate of change.
From Chapter 5, recall that:

$$\text{Rate of change} = \frac{\text{change in dependent variable}}{\text{change in independent variable}}$$

$$\text{Rate of change} = \frac{\text{change in } y}{\text{change in } x}$$

$\frac{\Delta y}{\Delta x}$ $\frac{\text{rise}}{\text{run}}$



The change in y is the rise.
The change in x is the run.

$$\text{So, slope} = \frac{\text{rise}}{\text{run}}$$

6.1 Slope of a Line

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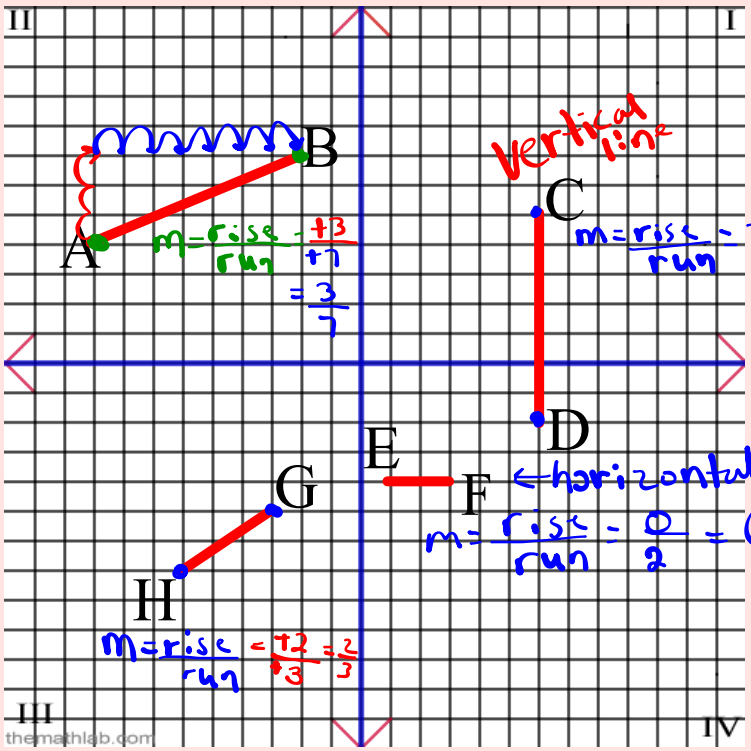


slope = $\frac{\text{rise}}{\text{run}}$

This is used when you can see the graph!

Calculating slope!

given points of ordered pairs

slope

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

Find the slope of a line passing through the points (2,-3) and (-5,8).

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

This is used when you are given co-ordinates.

1st point: $(x_1, y_1) = (2, -3)$ 2nd point: $(x_2, y_2) = (-5, 8)$

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

$$= \frac{8 - -3}{-5 - 2}$$

Be careful here add the opposit (Rule for intergers)

$$= \frac{8 + +3}{-5 + -2}$$

$$\frac{+11}{-7}$$

$$m = -\frac{11}{7}$$

all mean the same

$$-\frac{11}{7} \text{ OR } -\frac{11}{7} \quad \frac{11}{-7}$$

YOU TRY

Find the slope of a line passing through the points (7,5) and (8,-2).

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

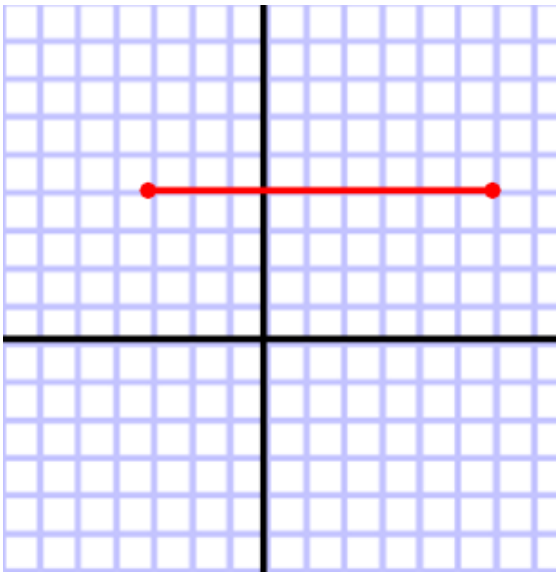
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{-2 - 5}{8 - 7}$$

$$= \frac{-7}{1}$$

Horizontal Line

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



Pick two points

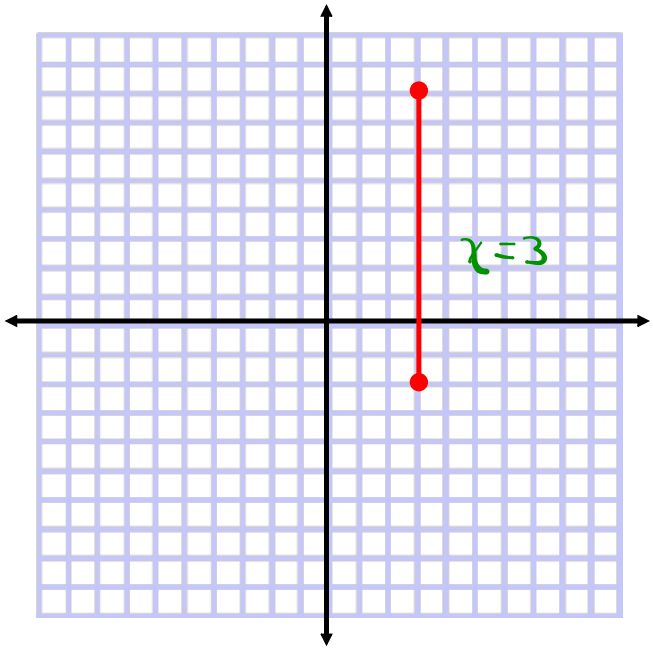
$m = \frac{\text{rise}}{\text{run}} = \frac{0}{9} = 0$

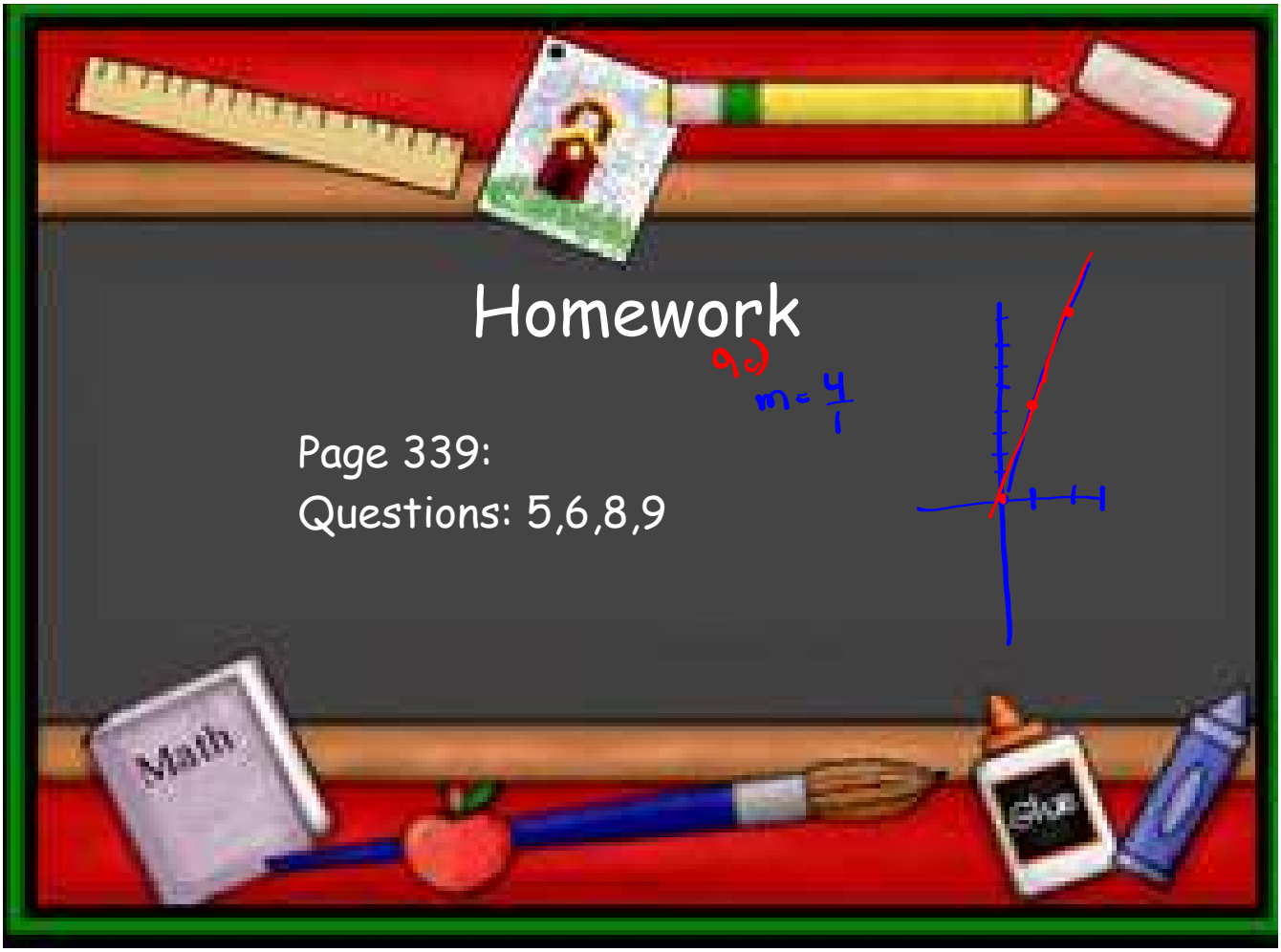
$m = 0$ for horizontal line

Vertical Line

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}} = \frac{10}{0} = \text{Undefind}$$

Always




Homework
9)
m = 4/1
Page 339:
Questions: 5,6,8,9
Math

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Calculate the slope.

1. (3,5) (2,8)

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

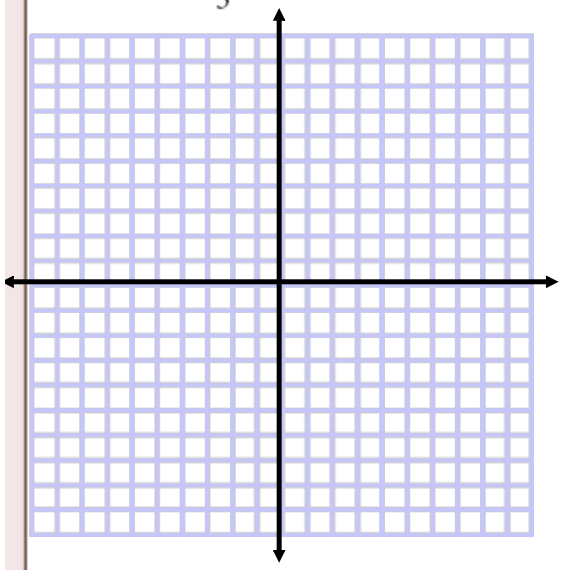
2. (-9,-2) (7,3)

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

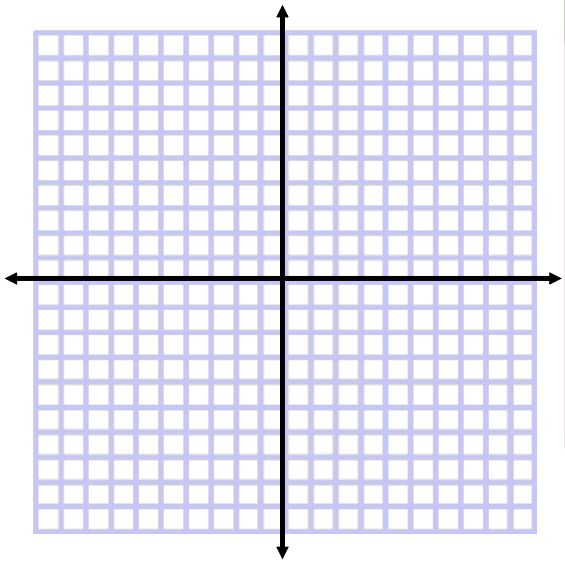
Example 2 Drawing a Line Segment with a Given Slope

Draw a line segment with each given slope.

a) $\frac{7}{5}$

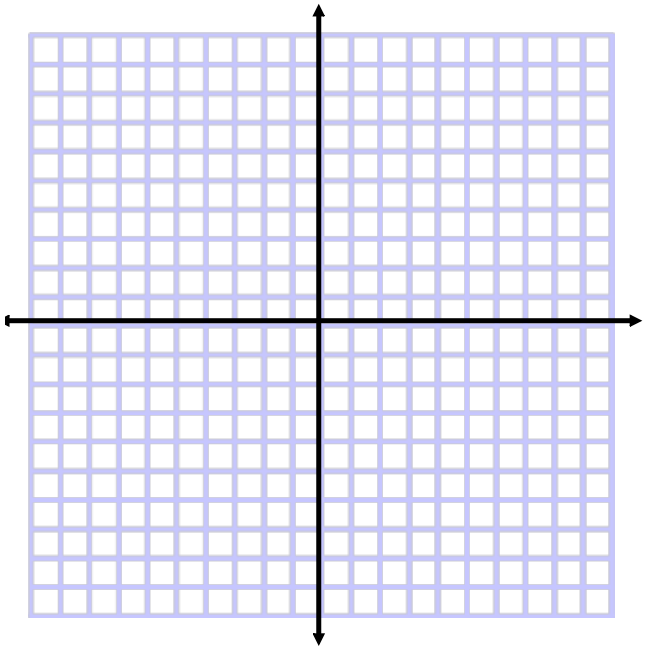


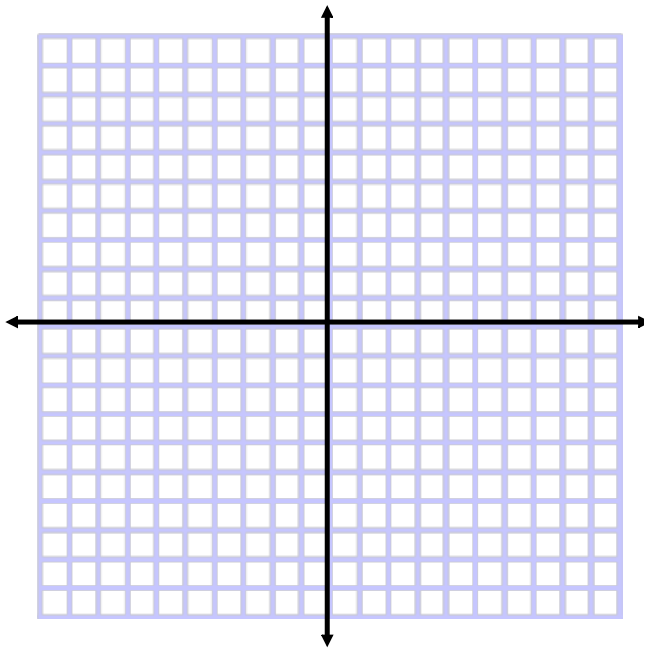
b) $-\frac{3}{8}$



2. Draw a line segment with each slope.

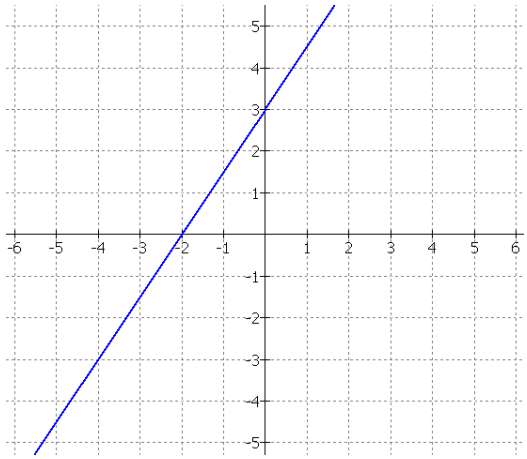
a) $\frac{4}{9}$ b) $-\frac{8}{3}$



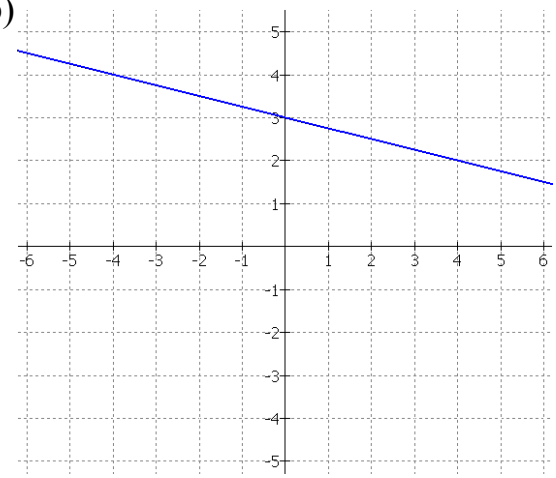


Determine the slope of each of the following lines:

(a)



(b)



Which ordered pairs should we use to make our calculation?

$$slope = \frac{\Delta y}{\Delta x}$$

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

$$slope = \frac{\Delta y}{\Delta x}$$

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