$$y = mx + b$$

slope → m   y-int → b

Chapter 6: Linear Functions

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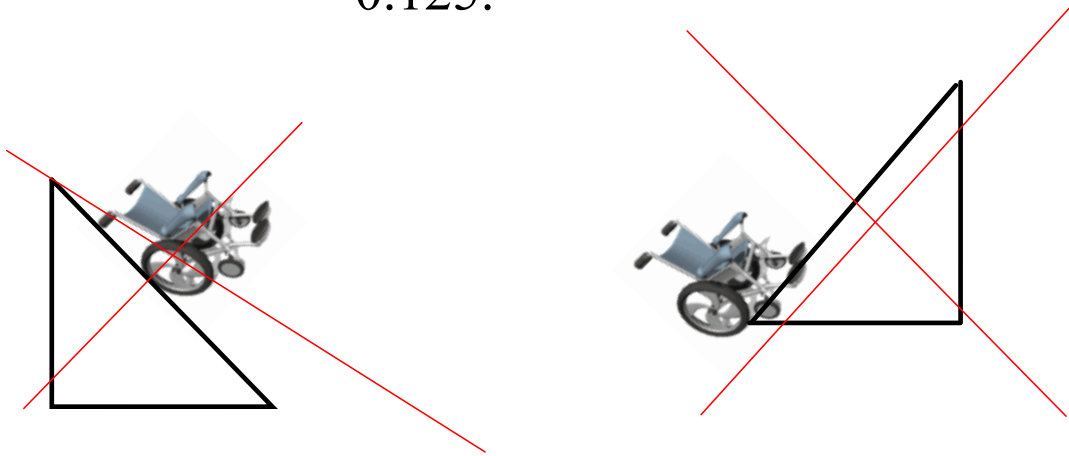
1

2

3

A wheelchair ramp
should not exceed
a slope of
0.125.

Building stairs
should
not exceed
a slope of
0.83

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.
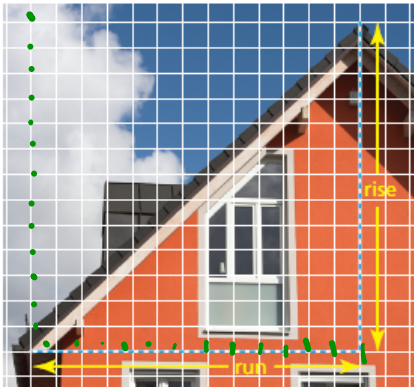The steepness of a roof is measured by calculating its **slope**.

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

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.
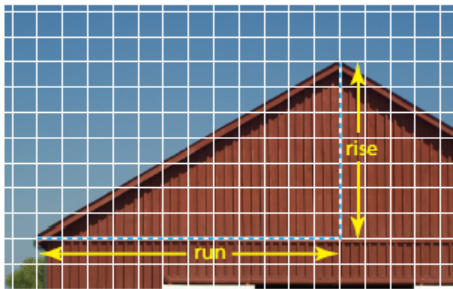
Roof A

For Roof A

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

$$\text{Slope} = ?$$

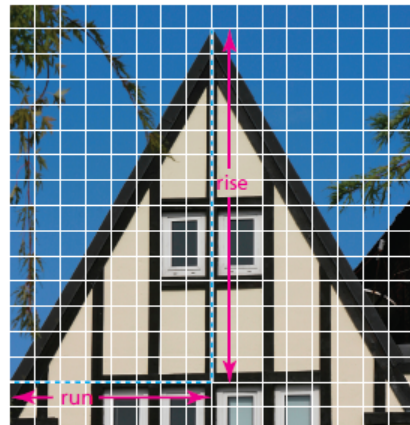$$\frac{13}{13} = 1$$

Roof B

For Roof B

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

$$\text{Slope} = ?$$

Roof C

For Roof C

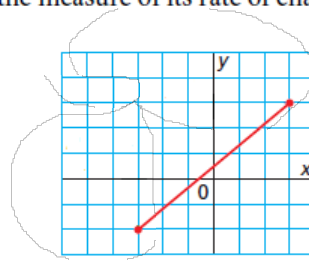$$\text{Slope} = \frac{\text{rise}}{\text{run}}$$

$$\text{Slope} = ?$$

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

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

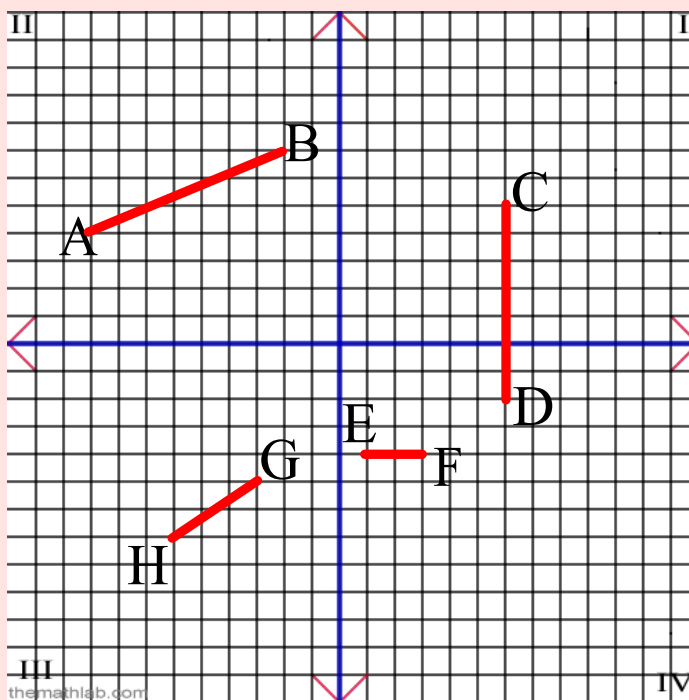$$\text{Rate of change} = \frac{\text{change in } y}{\text{change in } x}$$

The change in y is ?
The change in x is ?

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

11

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

This is used when you can see the graph!

themathlab.com

Calculating slope!

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

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.

$$\frac{8 - (-3)}{-5 - 2} = \frac{11}{-7}$$
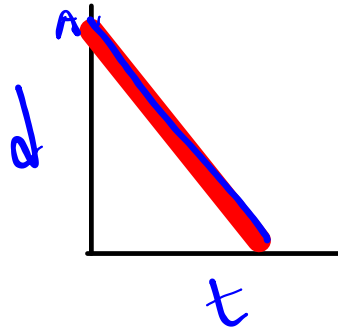
$$-\frac{11}{7}$$

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

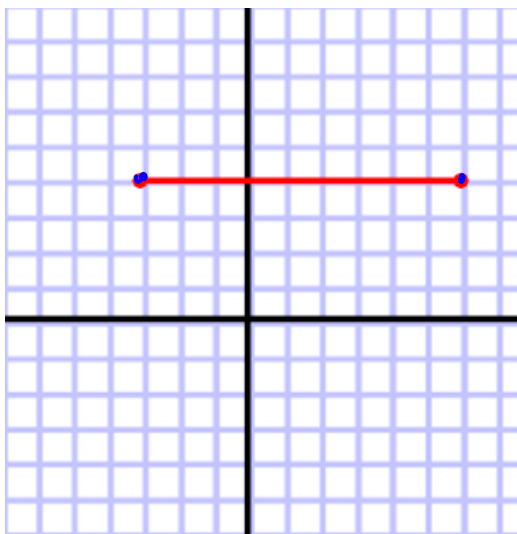Postive Slope- the line goes up and to the right

something increasing

Negative Slope- the line goes down and to the right

something is decreasing
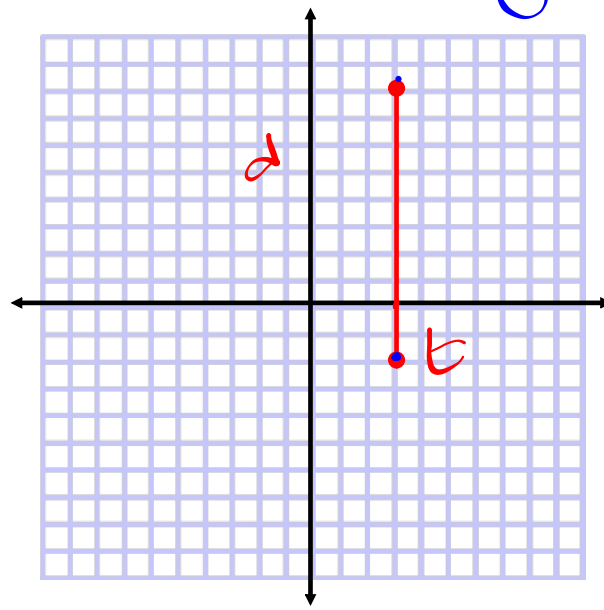
Horizontal Line

Slope is always zero

$$m = \frac{rise}{run}$$

$$= \frac{0}{9} = 0$$

$$m = \frac{10}{0} = \text{undefined}$$

Vertical

Line

d

t

15

Calculate the slope.

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

x_1 y_1 x_2 y_2

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

x_2 y_2 x_1 y_1

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

$$\frac{3 - (-2)}{7 - (-9)} = \frac{5}{16}$$

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

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

$$m = \frac{3}{-1}$$

$$m = \frac{-3}{1_1} = \boxed{-3}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
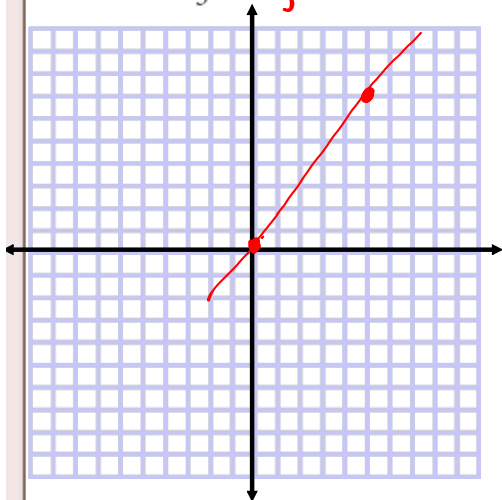
$$m = \frac{3 - (-2)}{7 - (-9)}$$

$$m = \frac{3 + 2}{7 + 9}$$

$$m = \frac{5}{16}$$

$(2,3) \quad (0,0)$
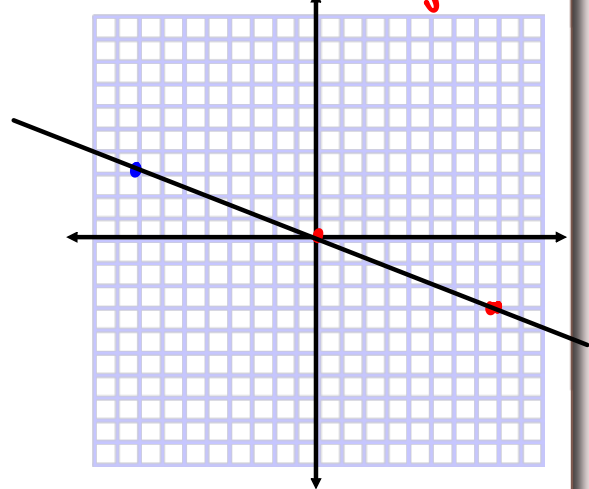
Example 2 Drawing a Line Segment with a Given Slope

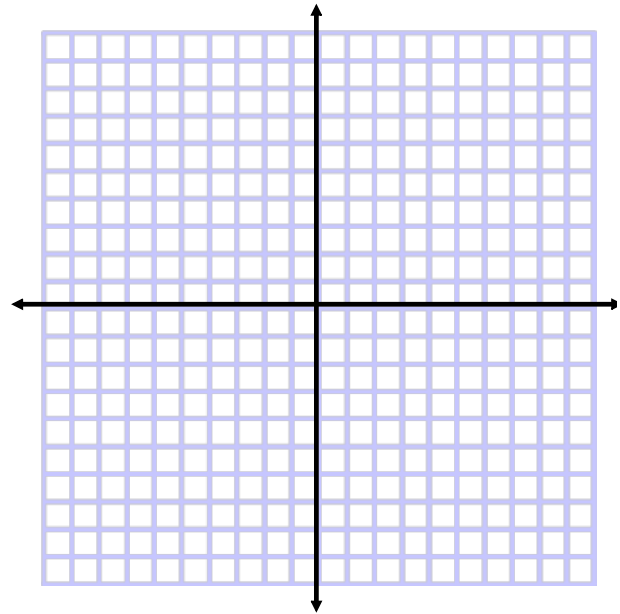Draw a line segment with each given slope.

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

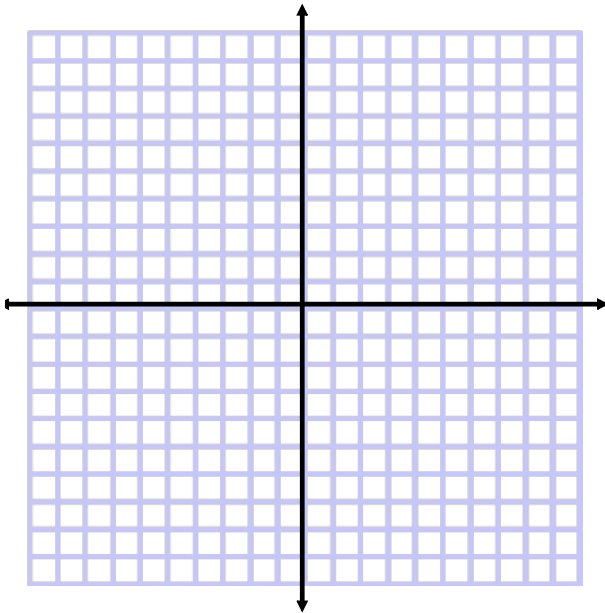b) $-\frac{3}{8}$ down 3 right 8

up 3 left 8

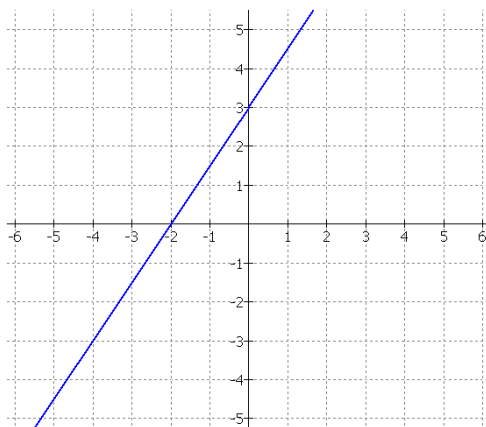**2.** Draw a line segment with each slope.

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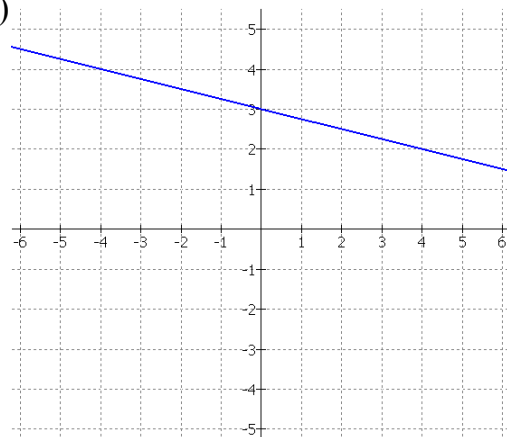

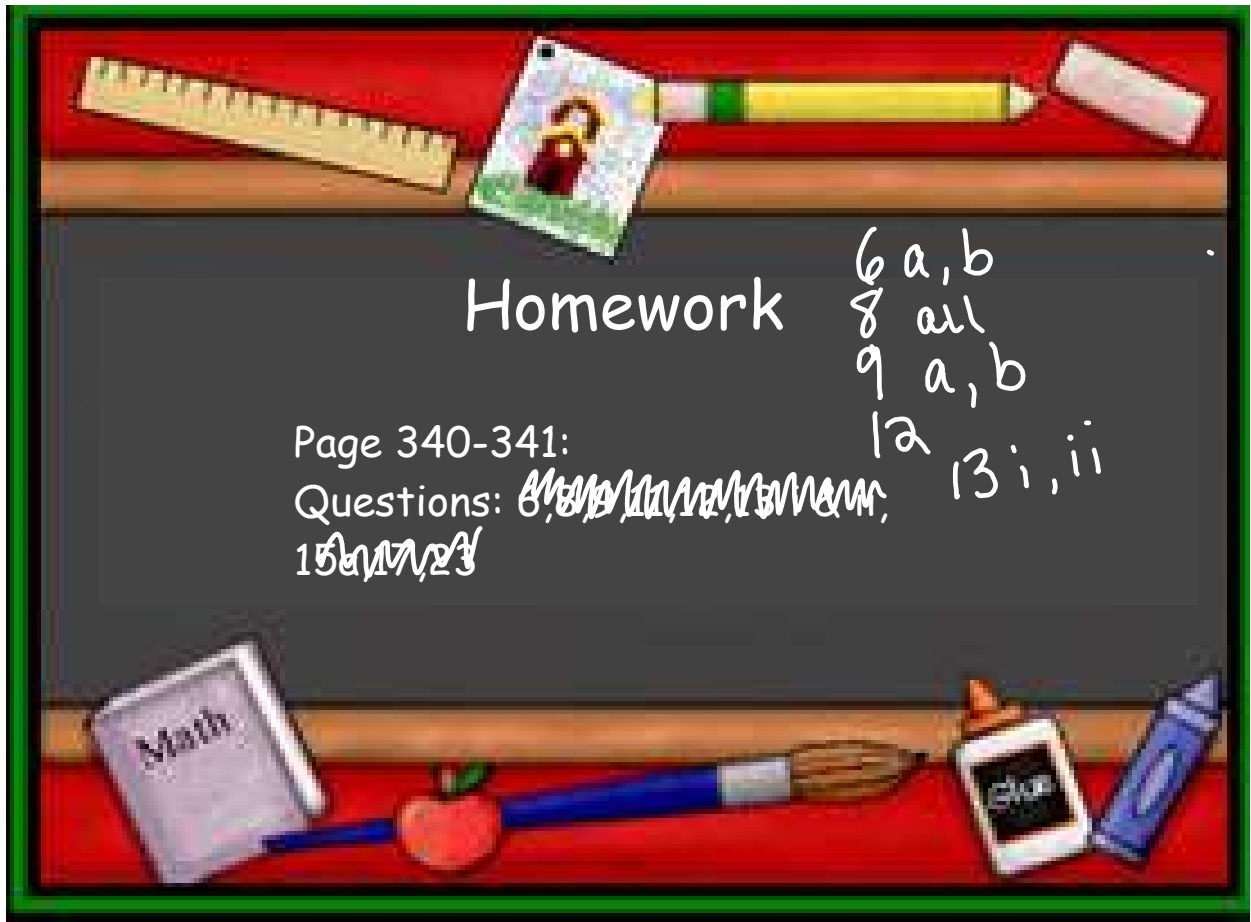Determine the slope of each of the following lines:

(a)

(b)

Which ordered pairs should we use to make our calculation?

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

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

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

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

Homework

Page 340-341:

Questions: ~~6,8,9,11,12,13 &~~

~~15,17,23~~

6 a,b
8 all
9 a,b
12
13 i, ii