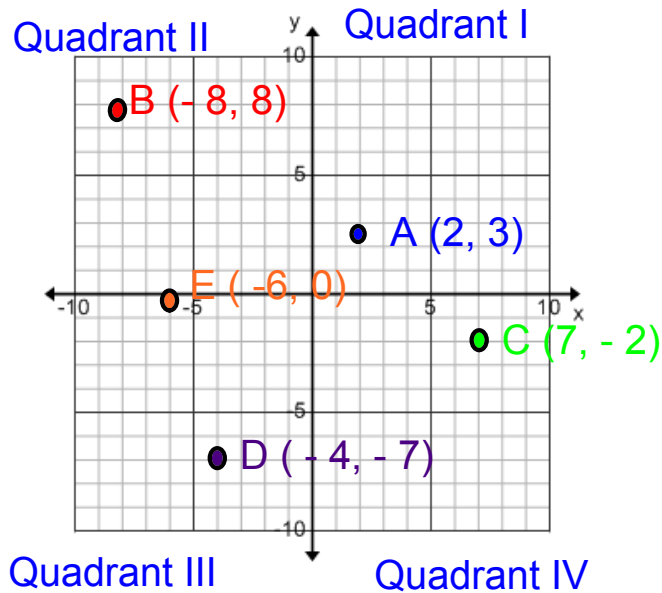


### Warm Up: Plotting points on a Cartesian Plane

Given the following items place them appropriately on the Cartesian Plane:



## MPM 1DI - Unit 4

### Modelling with Graphs

(Chapter 5 in textbook!)

### Day 3 - Slope

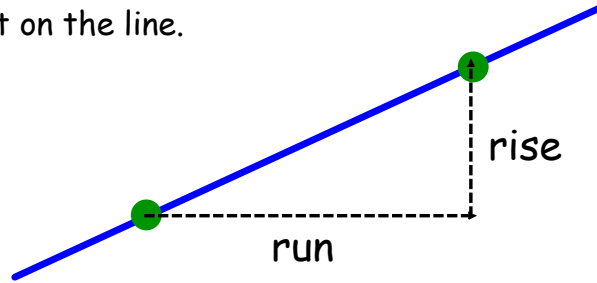
Today we will:

1. Define slope.
2. Identify different methods to determine slope of a line.

# Lines and Slope

The slope of a line is the **steepness** of the line.

To calculate the slope, we look at the change in distance, both vertically and horizontally, from one point to another point on the line.



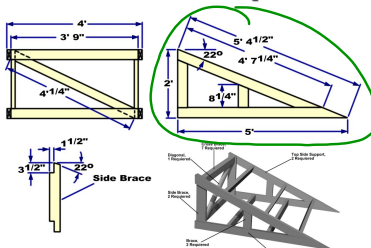
$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

Note: Instead of writing the word slope all the time, in math we use a lower case m. This comes from the french word "montier" which means to go up!

Why is being able to determine the steepness of a line an important skill?



### Skateboard Ramp Plans

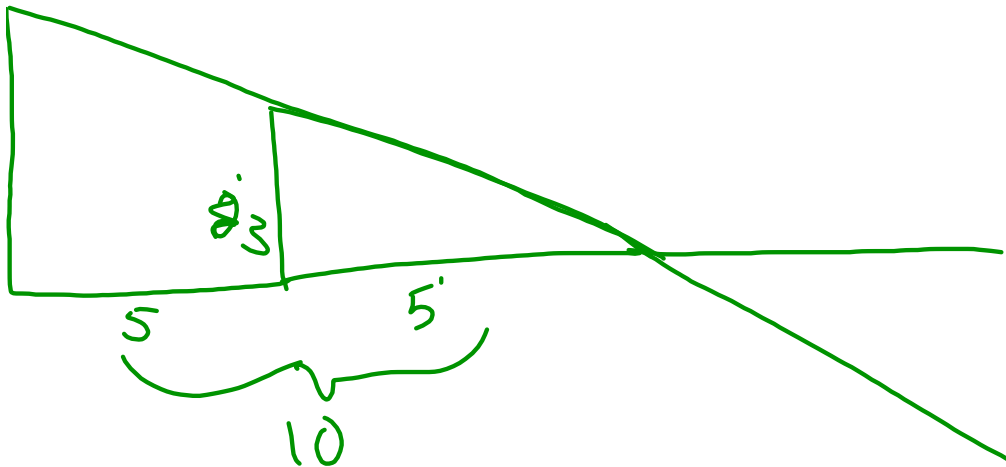


What is the slope of the skateboard ramp above?

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

$$\text{slope} = \frac{2}{5}$$

Explain the meaning of the slope in this situation.  
 for every 5 feet we run horizontally  
 we will rise 2 feet vertically



Example 1: Determine the slope of each line segment given on the graph below.

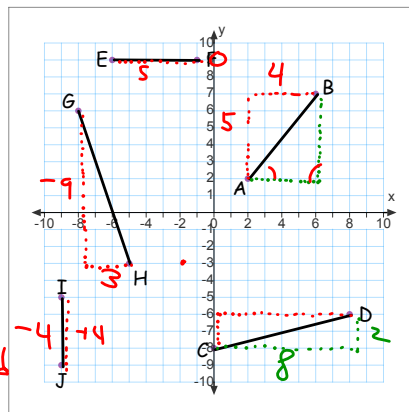
$$\text{slope } AB = \frac{5}{4}$$

$$\text{slope } CD = \frac{2}{8} = \frac{1}{4}$$

$$\text{slope } EF = \frac{0}{5} = 0$$

$$\text{slope } GH = \frac{-9}{3} = -3$$

$$\text{slope } IJ = \frac{4}{0} = \text{undefined}$$



Is there a way to calculate the slope if we are not given the graph, but instead just have two points that are on the line?

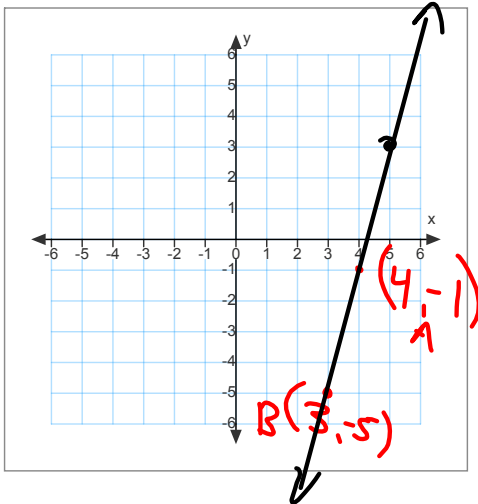
$$m = \frac{\text{change in } y}{\text{change in } x}$$

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

Now let's try it with the points A & B above!

Example 2: Given that a line has a slope of  $\frac{4}{1}$  and goes through the point  $B(3, -5)$ , find the coordinates of another possible point on the line.

Method 1: Using a graph



Method 2: Using the coordinate

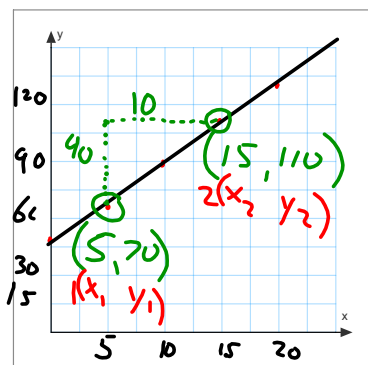
run (x direction) is  $\frac{1}{}$   
 rise (y direction) is  $\frac{4}{}$   
 Add these to the x and y values of the given point.

$$(3+1, -5+4)$$

$$(4, -1)$$

Example 3: Determine the slope of the line given by:

Method 1: Using a graph



$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = \frac{40}{10} = \frac{4}{1} = 4$$

X	Y
0	50
5	70
10	90
15	110
20	130

Method 2: Using the table

$$m = \frac{\text{change in y}}{\text{change in x}} = \frac{\text{Rise}}{\text{Run}}$$

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

$$m = \frac{110 - 70}{15 - 5}$$

On your individual white boards....

Define slope

Write the slope of the following line segment

Write the slope of the line using the graph

X	Y
3	11
5	16
7	21
9	26
11	31

Today's Practice Questions:

pg 259 - 263 # 1, 3, 5, 7, 9, 11, 13, 15, 19

## Attachments

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Slopes.ppt