Name: _____

Lesson 6: Slope Between Two Points

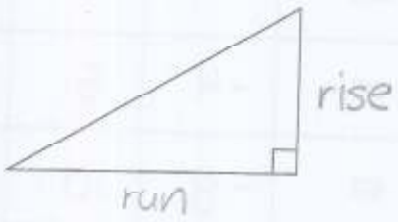
Slope: the steepness of a line.

The slope of a line is a ratio which is found by dividing the vertical change by the horizontal change.

The vertical change is called the rise.

The horizontal change is called the run.

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

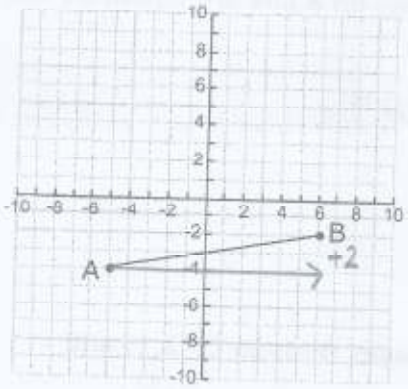


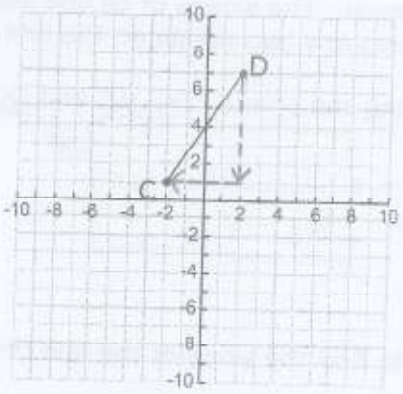
If a line **rises** from left to right, then its slope is positive.

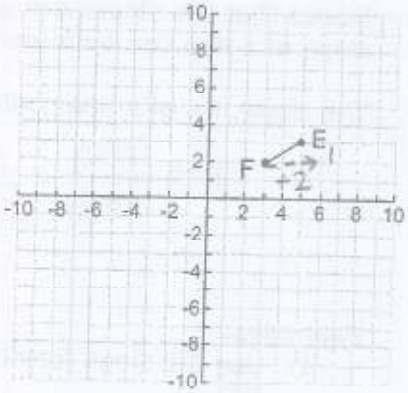
If a line **falls** from left to right, then its slope is negative.

up & right → +
down & left → -

Let's look at a few line segments with positive slope:







Line Segment	Rise	Run	Slope
AB	2	+11	2/11
CD	-6	-4	-6/-4 = 3/2
EF	1	2	1/2

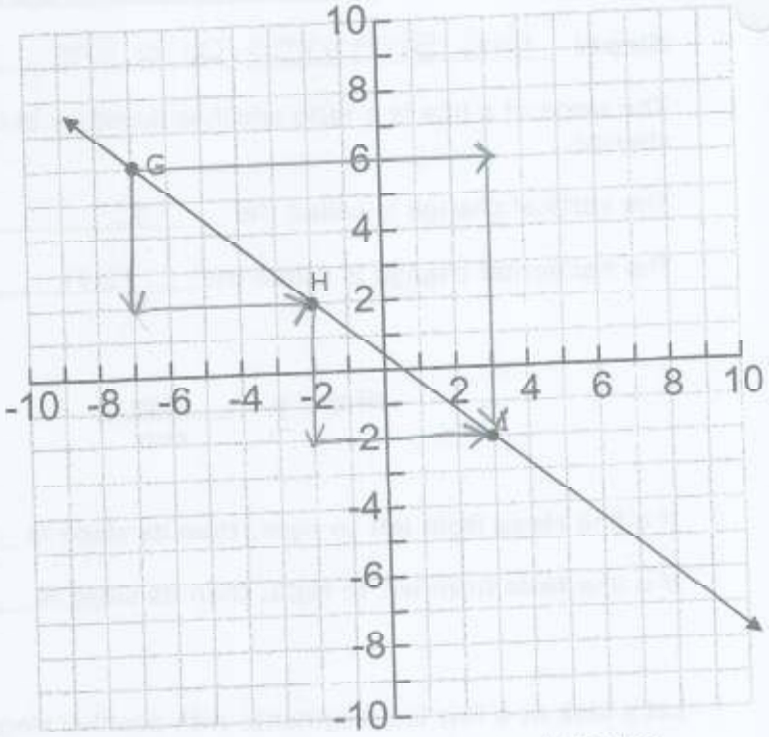
1. Which line segment is the steepest? CD

2. Which line segment has the greatest slope? CD

Name: _____

Let's look the following line segments with negative slope:

Line Segment	Rise	Run	Slope
GH	-4	5	$-\frac{4}{5}$
HI	-4	5	$-\frac{4}{5}$
GI	-8	10	$-\frac{4}{5}$



Notice that the slopes are all equal. The slopes of all line segments on a line are equal. So the slope of a line can be found using any two points on the line.

The slope, m, of a line containing the points $P(x_1, y_1)$ and $Q(x_2, y_2)$ is

$$m = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \boxed{\frac{y_2 - y_1}{x_2 - x_1} = m} \quad *$$

Examples:

1. Use the slope formula to find the slope of the line that passes through C(-2,1) and D(2,7)

$x_1 y_1$ $\quad$ $x_2 y_2$

$$m = \frac{7-1}{2-(-2)} = \frac{6}{4} = \frac{3}{2}$$

2. Use the slope formula to find the slope of the line that passes through (-5,10) and (2,10)

$x_2 y_2$ $\quad$ $x_1 y_1$

$$m = \frac{10-10}{-5-2} = \frac{0}{-7} = 0$$ ← horizontal lines have 0 slope.

3. Use the slope formula to find the slope of the line that passes through (6,1) and (6,7)

$$m = \frac{7-1}{6-6} = \frac{6}{0}$$ ← undefined vertical lines have undefined slope.