Resource **Slope**

Calculating slope

In a linear relationship containing the points (x_1, y_1) and (x_2, y_2), slope can be computed using the formula:

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

Keep in mind:

- Slope can be computed using any two points on a line. The points might be given in a problem description, presented in a table, or read from a graph of the line.
- The "y" values are always the dependent values in the problem, even if you choose a different variable to represent them.
- The "x" values are always the independent values in the problem, even if you choose a different variable to represent them.

If you need to review how to use the slope formula, you can view examples in the following video:

- http://www.youtube.com/watch?v=2kMUk_XRvRQ

The points in each of the following examples are presented in different ways. Review the example, then try your own.

1) Use two points to compute slope.

Example 1: Calculate the slope of the line between the points $(3, -2)$ and $(4, 7)$.

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

$$m = \frac{7-(-2)}{4-3} = \frac{9}{1} = 9$$

You try: Calculate the slope of the line between the points $(-3, 5)$ and $(4, 16)$.

2) Use values in a table to compute slope.

Example 2: Calculate the slope of the line going through the points shown in the table and interpret the result.

Time (sec)	5	10	15	20
Distance (yd)	40	75	110	145

Choose any two points. For this example, we chose $(5,40)$ and $(15,110)$. The computation is as follows:

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

$$m = \frac{110 \text{ yd} - 40 \text{ yd}}{15 \text{ sec} - 5 \text{ sec}} = \frac{70 \text{ yd}}{10 \text{ sec}} = \frac{7 \text{ yd}}{1 \text{ sec}}$$

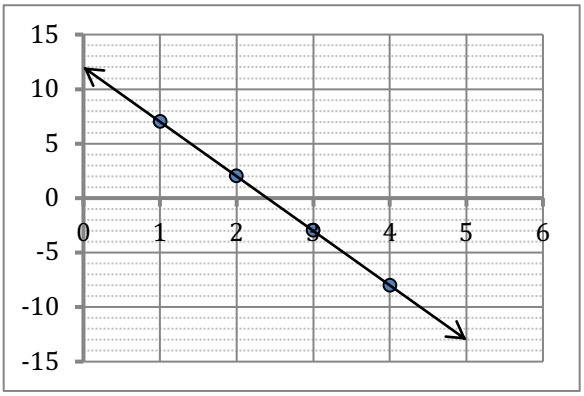
We interpret the slope using this statement: "The distance changes seven yards every one second."

You try: Calculate the slope of the line going through the points shown in the table and interpret the result.

Snacks	5	10	15	20
Cost ($)	15	30	45	60

3) Use values from a graph to calculate slope.

Example 3: Calculate the slope of the line shown in the graph.



Choose any two points from the graph. For this example, we chose $(2,2)$ and $(3,-3)$. The computation is as follows:

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

Continued on the next page.

$$m = \frac{-3-2}{3-2} = \frac{-5}{1} = \frac{-5}{1} = -5$$

You try: Calculate the slope of the line shown in the graph.