

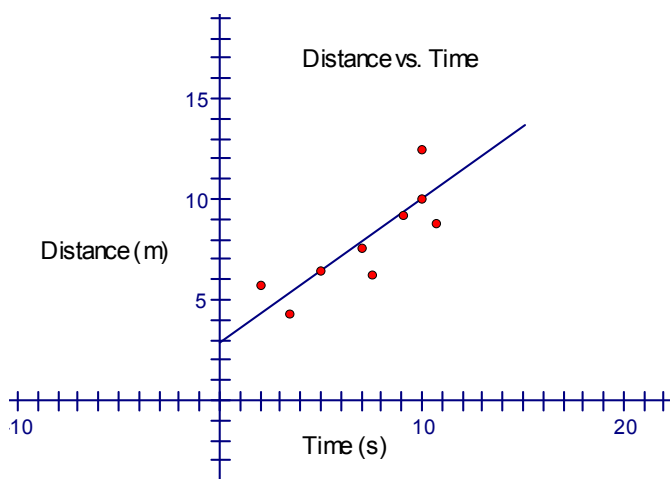
**📌 homework check:** Analyzing Two variable Data Asmt due now!

**📌 note:** Equations of Linear Relations

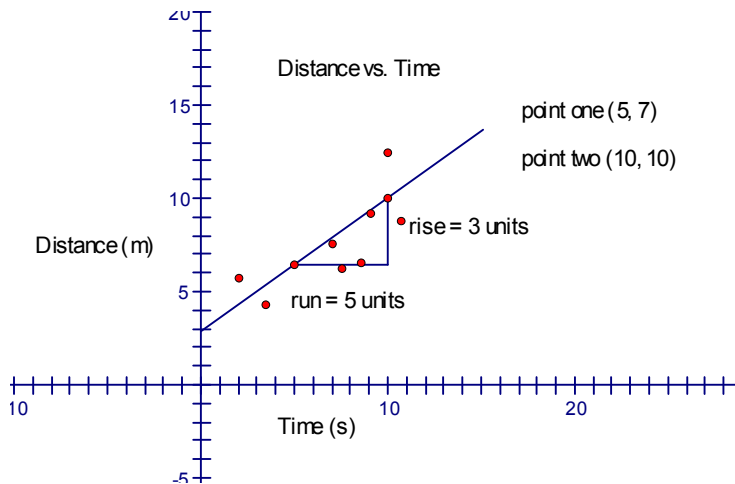
Once a relation is identified as linear, we can write the equation of the line in the form  $y = mx + b$ . By identifying each of these values ***m* (the slope) and *b* (the y intercept)**, we can identify the equation of a specific linear relation. The values of ***m* and *b*** can be identified from a graph, from a table of values, or from descriptive words.

**From a Graph:**

We use a rate triangle to determine the slope ***m*** of the line from a graph. The slope of the line is a constant rate of change used to describe how the relation increases or decreases. In order to use a rate triangle, we must identify any two points on the line of best fit. For example, given the relation



1. Identify any two points that are on the line of best fit.
2. Draw a rate triangle between these two points.
3. Calculate the slope of the line.



Therefore, the slope of the line is

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

$$= \frac{3}{5} m / s$$

The next step in writing an equation is identifying the y intercept (where the line crosses the y axis on the graph). On our graph, the line crosses the y axis at  $b = 3$ . Therefore, the equation of this linear relation is  $y = \frac{3}{5}x + 3$ .

**From a Table of Values:**

No. of People	Cost (\$)	First Differences
10	370	
20	470	
30	570	
40	670	
50	770	
60	870	

- Identify if the relation is linear.  
*calculate the first differences*
- Identify the fixed cost or the initial condition.  
*identify how much the venue costs before people are added*
- Write the equation.  
 $m = 10$   
 $b = 270$   
 $y = 10x + 270$

**From Descriptive Words:**

Carol makes \$10 an hour plus \$12 dollars for making lunch when she babysits. Write an equation that represents this relation.

1. Identify the rate of change (slope).  
*rate of change is \$10 per hour.*
2. Identify the fixed cost (y intercept).  
*fixed pay for making lunch \$12*
3. Write the equation.  
 $m = 10$   
 $b = 12$   
 $y = 10x + 12$

Wade delivers papers. He is paid \$0.25 per paper plus \$25 dollars for working at the paper.

1. Identify the rate of change (slope).  
*rate of change is \$0.25*
2. Identify the fixed cost (y intercept).  
*fixed pay is \$25.*
3. Write the equation.  
 $m = 0.25$   
 $b = 25$   
 $y = 0.25x + 25$

**# homework assignment: NPM 9 p. 146 #3 – 8, 13, 16, 18**