Name: Key Date: _____

Rate of Change

$$\textbf{Rate of Change} = \frac{f(x_2)-f(x_1)}{x_2-x_1} = \frac{y_2-y_1}{x_2-x_1}$$

Rate of Change with Points:

1. Find the rate of change, given the following points:

A. (5,1) and (−1,3).

$x_1\ y_1$ $x_2\ y_2$

$\frac{3-1}{-1-5} = \frac{2}{-6} = \boxed{-\frac{1}{3}}$

B. (12,5) and (10,−3).

$x_1\ y_1$ $x_2\ y_2$

$\frac{-3-5}{10-12} = \frac{-8}{2} = \boxed{4}$

Rate of Change with functions:

2. Find the rate of change for **f(x) = -2x – 6 from [0, 2].**

$f(2) = -2(2)-6 = -10$

$f(0) = -2(0)-6 = -6$

$\frac{-10-(-6)}{2-0} = \frac{-4}{2} = \boxed{-2}$

3. Find the rate of change for **f(x) = 2x² – 3 from [-2, 1].**

$f(1) = 2(1)^2-3 = -1$

$f(-2) = 2(-2)^2-3 = 5$

$\frac{-1-5}{1-(-2)} = \frac{-6}{3} = \boxed{-2}$

4. Find the rate of change for **f(x) = 2x² + 3x – 4 from [-3, -1].**

$f(-1) = 2(-1)^2+3(-1)-4 = -5$

$f(-3) = 2(-3)^2+3(-3)-4 = 5$

$\frac{-5-5}{-1-(-3)} = \frac{-10}{2} = \boxed{-5}$

Rate of Change with Tables

5. Find the rate of change using the table.

x	f(x)
-1	-10
0	-4
1	2
2	10
3	22

A. Find the rate of change from 0 to 2.

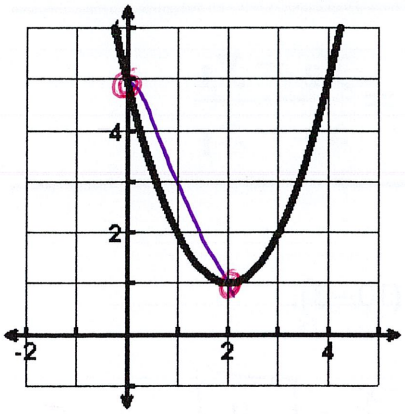
$\frac{10-(-4)}{2-0} = \frac{14}{2} = \boxed{7}$

B. Find the rate of change from -1 to 3.

$\frac{22-(-10)}{3-(-1)} = \frac{32}{4} = \boxed{8}$

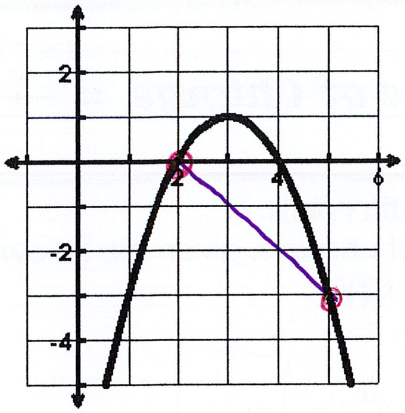
Rate of Change with Graphs

6. Find the rate of change from [0, 2]



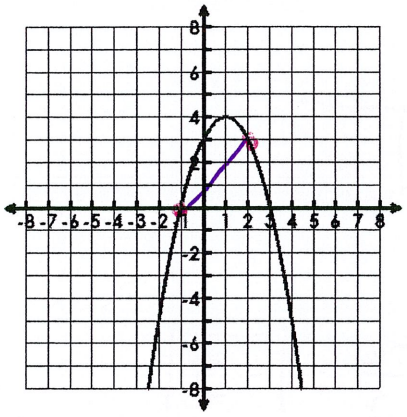
$\frac{1-5}{2-0} = \frac{-4}{2} = -2$

7. Find the rate of change from [2, 5]



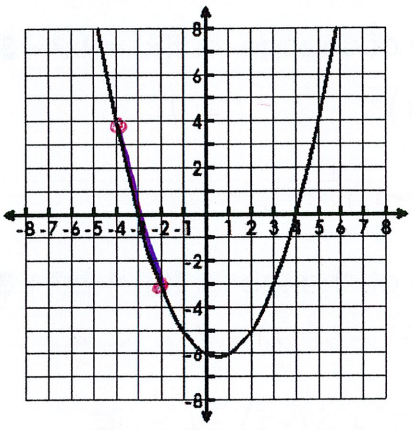
$\frac{-3-0}{5-2} = \frac{-3}{3} = -1$

8. Find the rate of change from [-1, 2]



$\frac{3-0}{2-(-1)} = \frac{3}{3} = 1$

9. Find the rate of change from [-4, -2]



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