Math 60, Sections 4.3 and 4.4 Class Prep   Name:_____

<u>Watch the videos and take notes on this page</u>   <u>Due at the Beginning of Next Class</u>

Section 4.3 Rates of Change

<u>Modeling Data with Two Variables</u>
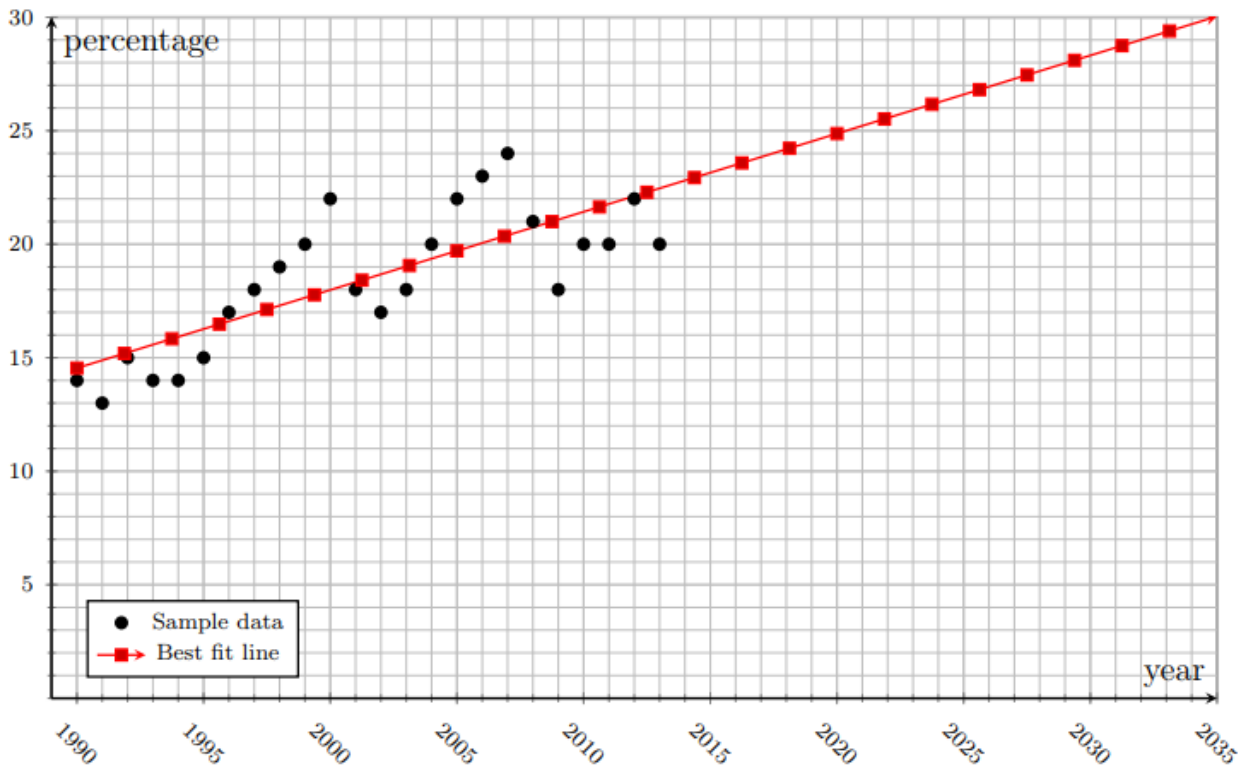
1. Use Figure 1 to answer each question.

FIGURE 1. Share of all income held by the top 1% in the United States, 1990-2013
Source: http://epi.org/blog/new-data-show-top-1-percent-really-are-different-from-you-and-me/

a. State the data values for the years 2000 and 2001. How did the percentage change in this year?

b. State the data values for the years 2002 and 2007. How did the percentage change over these 5 years?

c. State the answers from parts a and b as rates of change.

$$\text{Rate of change} = \frac{\text{change in } y}{\text{change in } x}$$

Patterns in Tables

2. Identify the pattern in each table below. In other words how could y be calculated given x? Write an equation in the form $y = \ldots$. Then find the rate of change if it is constant.

a.

x	y
-2	-8
-1	-4
0	0
1	4
2	8
3	12

Equation:

Rate of Change:

b.

x	y
-2	-7
-1	-3
0	1
1	5
2	9
3	13

Equation:

Rate of Change:

c.

x	y
-2	4
-1	1
0	0
1	1
2	4
3	9

Equation:

Rate of Change:

d.

x	y
-200	-20
-100	-10
0	0
100	10
200	20
300	30

Equation:

Rate of Change:

Section 4.4 Slope

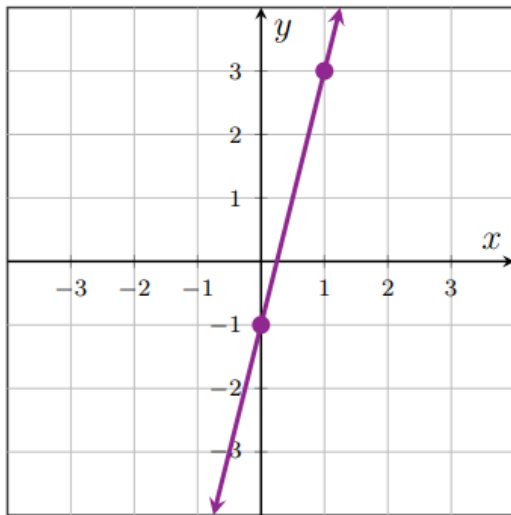3. Which of these signs involve rate of change?

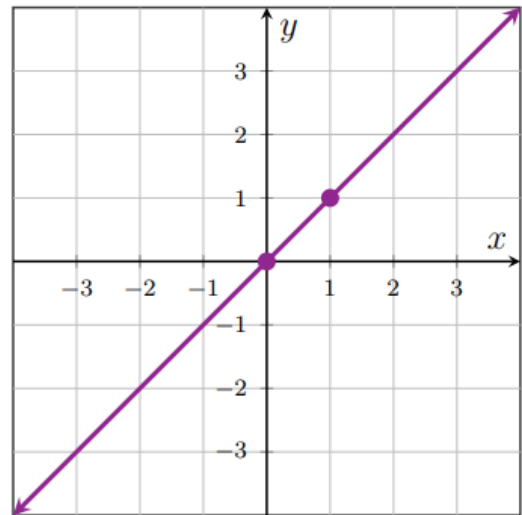<u>Slope is a rate of change</u>

$$\text{Slope} = \text{Rate of change} = \frac{\text{change in } y}{\text{change in } x} = \frac{\text{rise}}{\text{run}}$$

4. Find the slope of each line using its graph.

a.

b.

5. Find the slope of each line again, using the formula.

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

a. $(1,3)$ and $(0,-1)$

b. $(1,1)$ and $(0,0)$

6. What is the slope of a horizontal line? A vertical line?