Name: _____ Date: _____ Hour: _____

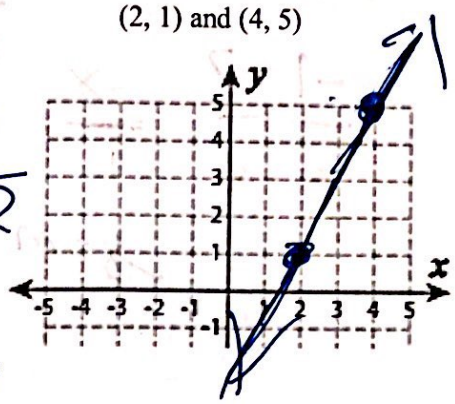
Unit 3A Day 7: Rate of Change Given 2 Points

Focus Question: What are some strategies for finding the rate of change when I only know two points on a line?

A. Two points: From a Picture to a Formula

1. Find the rate of change between the two points

(2, 1) and (4, 5)



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2. Turn the two points into a table and find the rate of change.

x	y
2	1
4	5

4-2 +2 +4 5-1

3. When you find the change in the table, what operation are you doing?

Subtraction

4. When Ms.Millett was 9 months pregnant, she weighed 170 pounds. Before she was pregnant she weighed 130 pounds. How much did her weight change? (Show your work)

$\frac{170-130}{9-0}$ $\frac{40 \text{ lbs}}{9 \text{ mo}}$

5. Remember how mathematicians think of rate of change. Which part was most helpful for a table?

Slope = Rate of Change $= \frac{\text{Change in D.V.}}{\text{Change in I.V.}} = \frac{\text{Change in } y \text{ axis}}{\text{Change in } x \text{ axis}} = \frac{\text{vertical Change}}{\text{horizontal Change}} = \frac{\text{Rise}}{\text{Run}}$

What operation finds "change?" Subtraction

6. Explain the mathematician's formula below.

$$\frac{y_2 - y_1}{x_2 - x_1} \qquad \frac{5-1}{4-2} = \frac{4}{2}$$

y_2 is read as "y sub 2" and means the 2nd y value.

7. Label the 2 points from question 1 and use the formula to see if you get the same answer. (2, 1) and (4, 5)

B. Write the formula on this side of the paper.
Use the formula to find the rate of change between each pair of points

1. (4, 7) and (5, -1)

$\frac{y_2 - y_1}{x_2 - x_1}$

$\frac{-1-7}{5-4} \quad \frac{-8}{1}$

$-8 = m$

2. (2, -7) and (-1, 6)

$\frac{6-(-7)}{-1-2} = \frac{13}{-3}$

3. (-3, 3) and (7, 6)

$\frac{6-3}{7-(-3)} = \frac{3}{10}$

4. (-1, -9) and (5, -8)

$x_1\ y_1 \quad x_2\ y_2$

$\frac{-6+(+9)}{5+(+1)} \quad \frac{3}{6}$

5. (-4, 9) and (-5, 8)

$\frac{8-9}{-5-(-4)} = \frac{-1}{-1} = 1$

6. (8, -3) and (-7, -1)

$x_1\ y_1 \quad x_2\ y_2$

$\frac{-1+(+3)}{-7-8} \quad \frac{2}{-15}$

7. (-3, 7) and (4, 7)

$\frac{7-7}{4-(-3)} = \frac{0}{7}$ zero slope

8. (-2, 4) and (-2, 9)

$\frac{9-4}{-2-(-2)} = \frac{5}{0}$

undefined