

BUTCHER TECH MATH B PERIOD 1 OFF-SITE LEARNING PACKET DAY 8

Instructor Nancy Butcher

Date Day 8

Program/Class Tech Math

Period 1, 2, 3

State Indicator/Competency:

- Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

Instructional Objective(s):

- Students will be able to write the equation of a line given 2 points with 80% accuracy.

Instructions:

1. Read through lesson and examples.
2. If able, watch suggested videos for extra instruction.
3. Complete the practice problems. Check your answers to see how you're doing.
4. Complete attached worksheet. Show your work. Worksheet will be collected and graded.

Questions? Contact me by email. butcherna@mwood.cc

Activities:

Point-slope equation of a line is: $y - y_1 = m(x - x_1)$

Slope formula:

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

Helpful videos:

Finding the slope given two points: <https://www.youtube.com/watch?v=pv1PR8yP1zM>

Point – Slope form: <https://www.youtube.com/watch?v=aQhb84bZDzw>

16-6 Determining an Equation, Given Two Points

If you know two points on a straight line, you can write the equation of the line by:

1. Finding the slope
2. Using the Point-Slope Form of the line. $y - y_1 = m(x - x_1)$

Examples:

1. Find the equation of a straight line that passes through two point whose coordinates are (1, 2) and (5, 7).

Step 1: Find the slope $m = \frac{7-2}{5-1} = \frac{5}{4}$

Step 2: Use the slope and one of the points to plug into the Point-slope form (either point will work)

$$y - y_1 = m(x - x_1) \quad 5/4 \text{ in for } m; 2 \text{ in for } y_1; \text{ and } 1 \text{ in for } x_1$$

$$y - 2 = \frac{5}{4}(x - 1) \quad \text{Distribute}$$

$$y - 2 = \frac{5}{4}x - \frac{5}{4} \quad \text{Simplify}$$

$$y = \frac{5}{4}x + \frac{3}{4}$$

4. (-2, -1) and (1, -3)

Step 1: Find the slope $m = \frac{-3+1}{1+2} = -\frac{2}{3}$

Step 2: Use the slope and one point to fill in the point-slope equation

$$y - y_1 = m(x - x_1) \quad -2/3 \text{ in for } m; -1 \text{ in for } y_1; \text{ and } -2 \text{ in for } x_1$$

$$y + 1 = -\frac{2}{3}(x + 2)$$

$$y + 1 = -\frac{2}{3}x - \frac{4}{3} \quad \text{Distribute}$$

$$y = -\frac{2}{3}x - \frac{7}{3} \quad \text{Simplify}$$

Practice and check your work:

Find the equations of the lines.

1. $m = \frac{12}{5}, b = \left(\frac{3}{4}, -\frac{5}{8}\right)$

Answer: $y = \frac{12}{5}x - 2.425$

2. $m = -5$, point: $(7.1, -6.5)$

Answer: $y = -5x + 29$

3. $(3, -1); (-1, 3)$

Answer: $y = -x - 2$

4. $(-7, -4); (-8, -2)$

Answer: $y = -2x - 18$

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Point-Slope

Name: _____ Pd: _____

Write the equation of each line formed by the two points given. Find the slope and use the Point-Slope form of the line:

Point-slope equation of a line is: $y - y_1 = m(x - x_1)$

Slope formula:

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

1. $(3, 2); (5, 3)$

2. $(6, 4); (2, 7)$

3. $(0, 5); (6, 1)$

4. $(2, -5); (4, -6)$

5. $(-6, 7); (0, 3)$

6. $(-8, 3); (8, 6)$