

## BUTCHER TECH MATH B PERIOD 1 OFF-SITE LEARNING PACKET DAY 7

Instructor Nancy Butcher

Date 7

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 use point-slope form to write the equation of a line 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.
5. Questions? Contact me by email. [butcherna@mwood.cc](mailto:butcherna@mwood.cc)

### Activities:

#### **16-5 Point-Slope Equation of a Straight Line**

If you know the slope and *one point* on the line, you can write the equation of the line.

The general equation for the point-slope equation of a line is:

$$y - y_1 = m(x - x_1)$$

Where  $(x_1, y_1)$  is a point and  $m$  = slope.

1. The slope ( $m$ ) of a line is  $\frac{2}{3}$  and the line passes through the point  $(3, 7)$ . Write the equation of the line.

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

1. Use the point-slope form and insert  $2/3$  for  $m$ ; 3 for  $x_1$ ; 7 for  $y_1$

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

2. Distribute to get rid of parenthesis.

$$y = \frac{2}{3}x + 5$$

3. Add 7 to both sides to solve for  $y$

2.  $m = \frac{3}{4}$ , point: $(-4, -8)$

$$y - y_1 = m(x - x_1)$$

$$y + 8 = \frac{3}{4}(x + 4)$$

Use the point-slope form and insert  $3/4$  for  $m$  and  $-4$  and  $-8$  in for  $x_1$  and  $y_1$

$$y + 8 = \frac{3}{4}x + 3$$

Distribute to get rid of parenthesis

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

Add 8 to both sides to solve for  $y$

3.  $m = 2$ , point: $(5, -3)$

$$y - y_1 = m(x - x_1)$$

$$y + 3 = 2(x - 5)$$

Insert 2 for  $m$ ; 5 for  $x_1$ ;  $-3$  for  $y_1$

$$y + 3 = 2x - 10$$

Distribute the 2 to get rid of parenthesis

$$y = 2x - 13$$

Subtract 3 to solve for  $y$

**Practice and check your answers:**

Find the equations of the lines using the point-slope form;  $y - y_1 = m(x - x_1)$

1.  $m = \frac{1}{2}, b = (-2, -4)$

Insert  $\frac{1}{2}$  for  $m$ ; -2 for  $x_1$ ; -4 for  $y_1$

Distribute

Simplify

Answer;  $y = \frac{1}{2}x - 3$

2.  $m = -5$ , point:  $(7, -6)$

Answer:  $y = -5x + 29$

**Assessment:**

Worksheet 16.5 Attached (10 points)

Extra videos for help:

<https://www.youtube.com/watch?v=SqFj06Y3tI4>

<https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:forms-of-linear-equations/x2f8bb11595b61c86:point-slope-form/v/idea-behind-point-slope-form>

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Tech Math 16.5 – point-slope form

Name \_\_\_\_\_

Write the equation of the line given the slope (m) and the point (x, y) on the line.

$$y - y_1 = m(x - x_1)$$

1.  $m=3, (5,4)$

2.  $m=7, (-4,1)$

3.  $m=\frac{1}{2}, (-2,-4)$

4.  $m=-\frac{2}{3}, (12,-3)$

5.  $m=-\frac{2}{5}, (-3.25,5.1)$

6.  $m=-\frac{7}{5}, (273,-7.6)$