Lesson 3.3 Point-Slope Form Notes

Important Vocabulary

- **Independent Variable** – the variable that can be controlled; the _____ variable.
  _____ is USUALLY the independent variable.

- **Dependent Variable** – the variable that is affected by the other; the _____ variable.

Try It!
a. A person records the time he drives and the amount of gallons of gas he uses

b. A scientist records the amount of time it rains in a day and the inches of precipitation

c. Students record their reaction time based on the amount of hours they sleep

d. Scientist record the amount of people in the group and the time it takes the group to eat 100 hot dogs

- **Domain** – the set of all possible values for _____ (____ - variable)

- **Range** – the set of all possible values for the _____ (_____- variable)

**If you were to graph it, the domain comes from the numbers on the x-axis, the range comes from the y-axis.

Example: A scientist records the amount of hours it rains in a day and the inches of precipitation

x = time is hours	domain = in-between 0 and 24 hours
y = inches of precipitation	range = in-between 0 and 100 (could be less) or 0 to infinity

Try It! There are 20 people in the class. The teacher wants to create groups and record how many posters the group made in one period.
a. What is the independent and dependent variable?

b. Find the domain and range

Try It! There is an assembly at the football field. The football field bleachers can only fit 2500 people. There are currently 50 people at the assembly each minute 35 people join. The assembly will be an hour.
a. What is the independent and dependent variable?

b. What is a reasonable domain and range?

c. Write the situation above in explicit form?

d. Write the situation above in slope-intercept from?

e. When will there be more 354 people at the assembly?

f. At the end of the assembly how many people were be there?

Point-slope form

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

m = slope (x_1, y_1) = ANY POINT on the line

Try It! The slope of a line is 4 and one point on the line is (2, 3). Write a linear formula in point slope form.

Try It! Write the equation of the line that has a slope of -2 and passes through the point (12, -4)

Point-slope

Slope-intercept

Try It! Write each equation in point-slope form.

a. A line with a slope of – 3 passing through the point (– 1, 12)

b. A line passing through the point (12, – 4)
and (7, 6)

Try it! Write the equation in point-slope form. Then write it in slope-intercept form.

A line parallel to y = -3x + 2 and passes through point (4, -1)

Try It! y + 4= – 2(x – 12)

a. If x = 17, find y.

b. If y = 14, find x.

Try It! Given the information below, create an equation for the line
a. A line with the slope of -6 passing through point (3, 2) in point-slope form.

b. A line with the slope of 2 passing through point (– 3, 6) in slope-intercept form.

c. Two points on the line are (4, 7) and (10,2) in point-slope form.

d. Two points on the line are (– 3, – 5) and (2, –1) in slope-intercept form.

e. A line parallel to the line $y = 3/5\ x + 10$ passing through the point (0, 0) in point-slope form.

f. A line perpendicular to the line $-2x - y = 4$ and passing through the point (– 5, 12) slope-intercept form.

Try it! A candle is 6 in. tall after burning for 1 hour. After 3 hours it is 5.5 in. tall.
a. Write a linear equation to model the height y of the candle after burning x hours in point-slope form and slope-intercept form.

b. What is the real-world meaning of the slope? What is the real-world meaning of the y-intercept?

c. Use the equation to find how tall the candle will be after 5 hours.

d. How long will it take for the candle to burn out completely?

Practice!

1. A study was done comparing the amount of water needed to drink to rehydrate and the numbers of miles a person ran.

   a. What is the independent variable and the dependent variable?

   b. What is a reasonable domain and range?

2. Change the point-slope equation to slope-intercept form

   a. $y - 8 = 3(x - 2)$

   b. $y - 2 = (-4/3)(x + 3)$

3.

   a. Write the equation of a line that goes through (–2, – 5) and (3, 1) in point-slope form.

   b. Write the equation of a line that is perpendicular to part (a) and goes through the point (2, -9) in slope-intercept form.

   c. Write the equation of a line that is parallel to part (b) and goes through (-2, 0) in point-slope form.

4.

a. $y = 2 + 1(x - 1)$

i. Find x, when y = 18

ii. Find y, when x = 2

b. $y = -3 + 4(x - 3)$

i. Find x, when y = –3

ii. Find y, when x = –7

5. There are 2 leaves along 3 in. of an ivy vine. There are 14 leaves along 15 in. of the same vine.

a. Write an equation in point-slope form.

b What does x represent? What does y represent?

c. Write the equation in slope-intercept form.

d. What is the real-world meaning of the slope? What is the real-world meaning of the y-intercept?

e. How many leaves are there along 6 in of the vine?

f. How long is the vine if there are 38 leaves?