

## Writing, Solving, and Graphing Linear Equations

1. Your teacher grades your assignments partly for completion and partly for accuracy. You receive 50 points for turning in the assignment and 5 points for every question you get right. There are 10 questions on the assignment.

- a. Write a function to represent how many points you will earn if you get  $q = \#$  of questions right.

$$P(q) = 5q + 50$$

- b. According to your equation above, how many points do you earn if you get 7 questions right?

$$P(7) = 5(7) + 50 = 85 \text{ points}$$

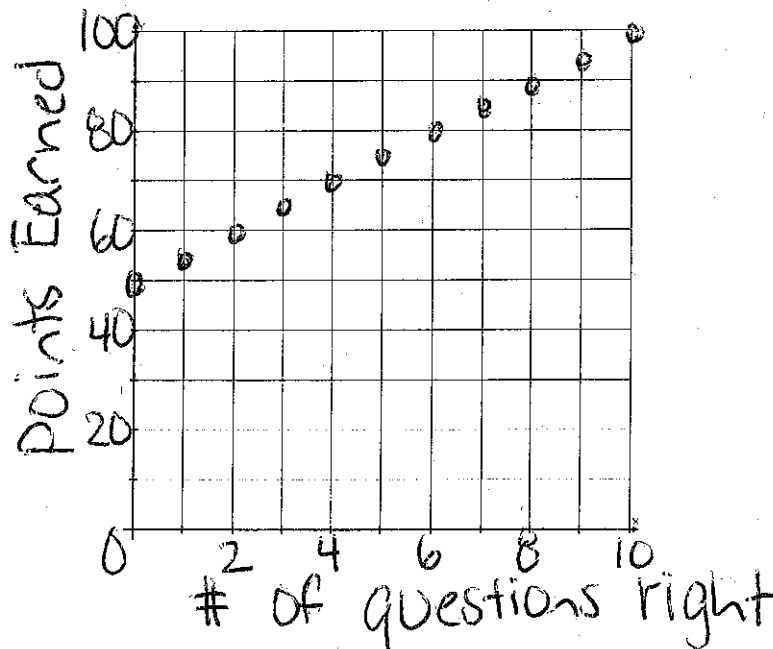
- c. If you received 75 points on an assignment, how many questions did you get right?

$$75 = 5q + 50 \quad 25 = 5q \quad q = 5 \text{ questions right}$$

- d. What is the maximum number of points that you could have gotten on the assignment.

$$P(10) = 5(10) + 50 = 100 \text{ points}$$

- e. Graph the function. Label the axes and the scale that you use. Pay attention to whether the function is discrete or continuous.



- f. What is the domain of the function?

$$\{0, 1, 2, 3, \dots, 9, 10\}$$

- g. What is the range of the function?

$$\{50, 55, 60, \dots, 95, 100\}$$

- h. What is the average rate of change for  $3 < q < 7$ ?

$$p(3) = 5(3) + 50 = 65$$

$$p(7) = 5(7) + 50 = 85$$

$$m = \frac{85 - 65}{7 - 3} = \boxed{5}$$

2. You are driving your car. You just filled up the tank with 10 gallons of gas. Your car can go 30 miles per gallon of gas.

- a. Write a function to represent the amount of gas left in your tank if you have driven  $m$  miles.

$$G(m) = -\frac{1}{30}m + 10$$

- b. According to your equation above, how much gas do you have left in your tank after 124 miles?

$$G(124) = -\frac{1}{30}(124) + 10 \quad 5.87 \text{ gallons}$$

- c. You want to refill when you only have 1 gallon left. How many miles can you drive before you want to refill?

$$1 = -\frac{1}{30}m + 10 \quad -30 = -9 = -\frac{1}{30}m - 30$$

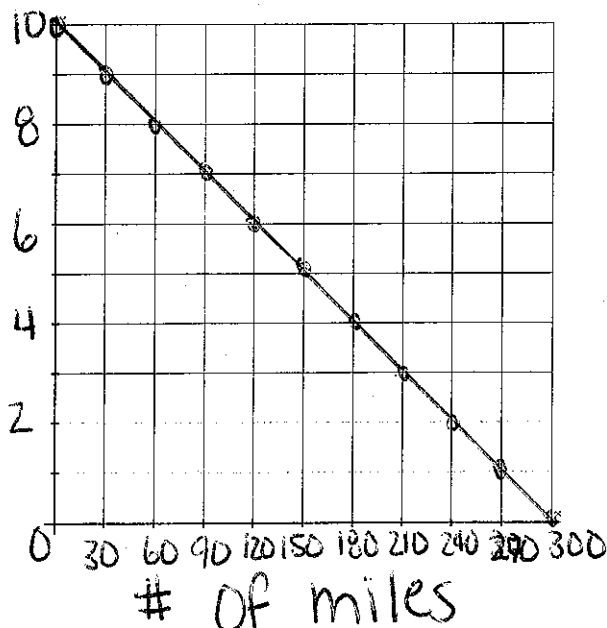
$$-10 \quad -10 \quad m = 270 \text{ miles}$$

- d. What is the most that you can drive before you are out of gas?

$$0 = -\frac{1}{30}m + 10 \quad m = 300 \text{ miles}$$

$$-10 = -\frac{1}{30}m$$

- e. Graph the function. Label the axes and scale that you use. Pay attention to whether the function is discrete or continuous.



- f. What is the domain of the function?

$$0 \leq m \leq 300$$

- g. What is the range of the function?

$$0 \leq G(m) \leq 10$$

- h. What is the average rate of change for  $105 < m < 170$ ?

$$G(105) = -\frac{1}{30}(105) + 10 =$$