

Unit 6- Day #10: Problem Solving using Systems of Equations- Day 2

Ms. Davis is moving and has to rent a moving truck. The rental company, *Budget Bumpers*, has a special promotion where any truck can be rented for a one-time fee of \$5 for gas, plus an additional charge of \$0.50 for each mile the truck is driven.

After doing some research online, Ms. Davis finds another truck rental company, *Reliable Rides*. This company will allow a person to rent a moving truck for a flat rate of \$1.00 per mile. There is no additional charge for gas.

$$x = \# \text{ of miles} \quad y = \text{total cost}$$

a.) Write a function that shows the total cost, y , to rent a car for x miles driven at Budget Bumpers.

$$y = \frac{1}{2}x + 5$$

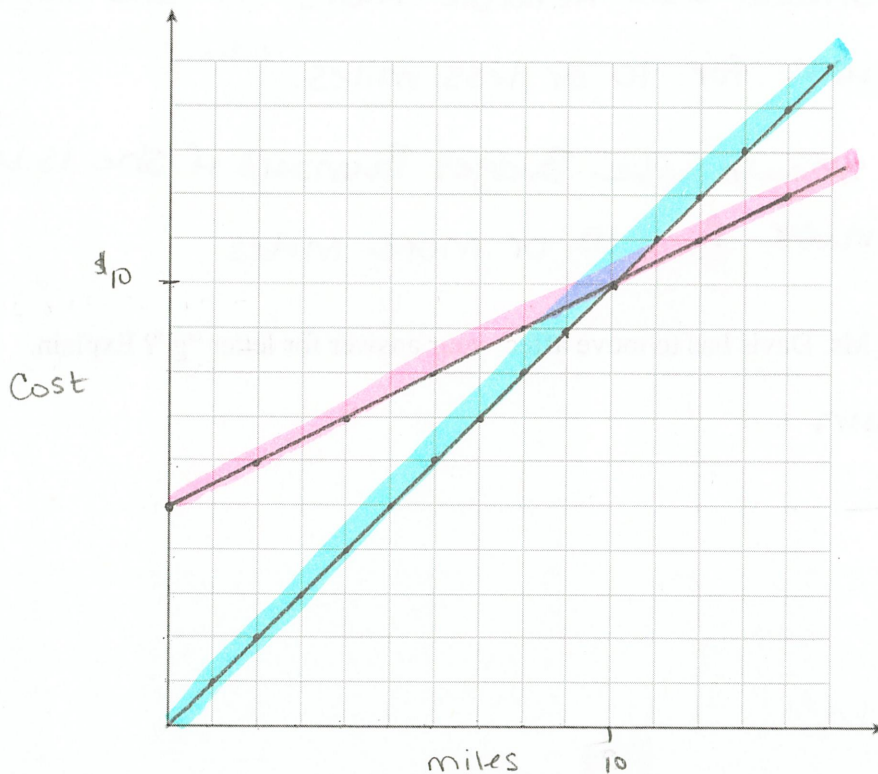
$$b = 5, m = \frac{1}{2}$$

b.) Write a function y , that shows the total cost to rent a car for x miles driven at Reliable Rides.

$$y = 1x$$

$$b = 0, m = 1$$

c.) Sketch a graph of both functions.



d.) Do the lines intersect? If so, where? Write the coordinate of the intersection of the points.

$$(10, 10)$$

e.) Look at your response for letter "d". What do you think your answer represents?

The point where the two companies cost is the same. \Rightarrow 10 miles cost \$10 for both companies

f.) Use another method that we have learned in class (substitution or elimination) to solve for the point you calculated in letter "d". Show your work below.

Substitution

$$y = \frac{1}{2}x + 5$$

$$y = x$$

$$x = \frac{1}{2}x + 5$$

$$2\left(\frac{1}{2}x = 5\right)$$

$$\underline{x = 10} \rightarrow \underline{y = 10}$$

Elimination

$$-\frac{1}{2}x + y = 5$$

$$x - y = 0$$

$$\frac{1}{2}x = 5$$
$$\frac{1}{2} \quad \frac{1}{2}$$

$$\underline{x = 10} \rightarrow \underline{y = 10}$$

g.) Which truck company should Ms. Davis use? Defend your answer using mathematical reasoning.

Ms. Davis should use Reliable Rides if she is using the truck for 10 or less miles.

Ms. Davis should use Budget Bumpers if she is using the truck for 10 or more miles.

h.) Does the distance that Ms. Davis has to move affect your answer for letter "g"? Explain.

Yes... Explain