

Name: _____ Date: _____ Period: _____

Scatter Plots and Line of Best Fit

MCC9-12.S.ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
MCC9-12.S.ID.6a Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use the given functions or choose a function suggested by the context. Emphasize linear and exponential models.
MCC9-12.S.ID.6c Fit a linear function for a scatter plot that suggests a linear association.

The **best fitting line or curve** is the line that lies as close as possible to all the data points.

Regression is a method used to find the equation of the best fitting line or curve.

Extrapolation - the use of the regression curve to make predictions outside the domain of values of the independent variable.

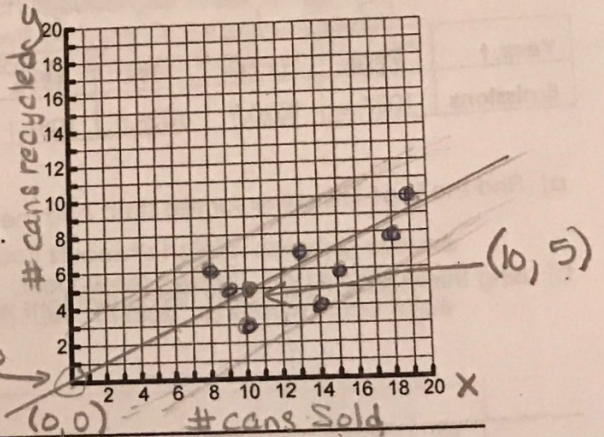
Interpolation - Interpolation is used to make predictions within the domain of values of the independent variable.

Line of Best Fit by Hand:

1) The environment club is interested in the relationship between the number of canned beverages sold in the cafeteria and the number of cans that are recycled. The data they collected are listed in this chart.

Beverage Can Recycling								
Number of Canned Beverages Sold	18	15	19	8	10	13	9	14
Number of Cans Recycled	8	6	10	6	3	7	5	4

- a) Plot the points to make a scatter plot.
- b) Use a straightedge to approximate the line of best fit by hand.
- c) Find an equation of the line of best fit for the data.



Handwritten calculations for the line of best fit:

$$b=0 \quad m=\frac{1}{2}$$

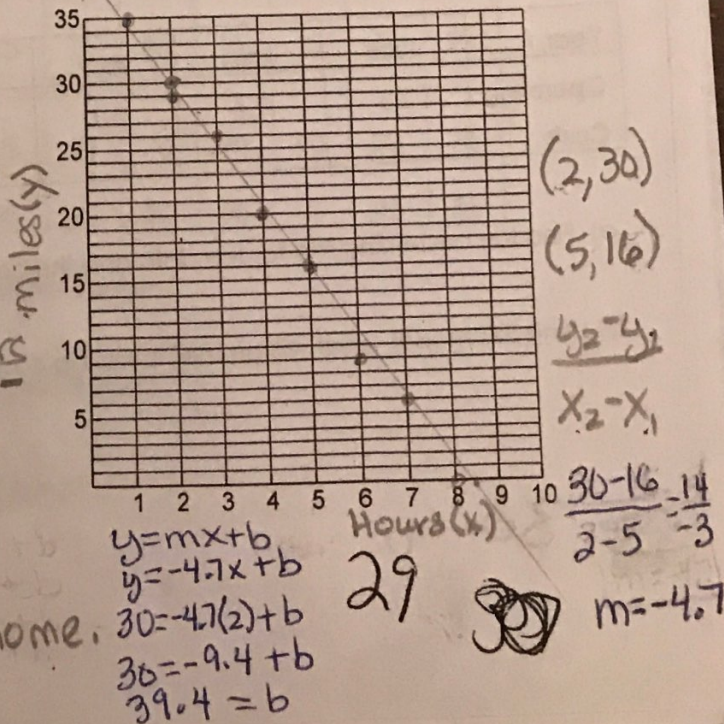
$$y=mx+b \Rightarrow y=\frac{1}{2}x+0 \Rightarrow y=\frac{1}{2}x$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 0}{10 - 0} = \frac{5}{10} = \frac{1}{2}$$

2. Mike is riding his bike home from his grandmother's house. In the table below, x represents the number of hours Mike has been biking and y represents the number of miles Mike is away from home. Make a scatter plot for this data on the grid below.

Hours (x)	1	2	3	4	5	6	7	8
Miles (y)	35	29	26	20	16	9	6	0

- a) Describe the association between the data points on the scatter plot.
- b) Use a straightedge to approximate the line of best fit.
- c) Find an equation of the line of best fit for the data.
- d) What does the slope represent in the context of the problem? What does the y-intercept represent in the context of the problem?



e) Could you use your equation to predict how far Mike would be after 10 hours? Use mathematics to justify your answer.

Handwritten answer: Mike would have traveled 39.4 miles from grandmother's house to home.