Interpreting Scatterplots - NOTES

Name: _____   Date: _____

- <u>Data</u>: any set of numbers

    o <u>Univariable data</u>: A single set of numbers

        ▪ Example: a business owner's list of monthly sales amounts

    o <u>Bivariate data</u>: data that lists pairs of numbers and shows a relationship between paired numbers

- <u>Scatterplot</u>: a graph that shows bivariate data using points on a graph

    o <u>Trend</u>: a general pattern

        ▪ <u>Correlation</u>: an association between the two variables

            - <u>Positive correlation</u>: when the value of one variable increases while the value of the other variable also increases

            - <u>Negative correlation</u>: when the value of one variable increases while the value of the other variable decreases

- Types of variables:

  o Explanatory variable: the variable which *causes* the chance in the other variable (independent variable)

  o Response variable: the affected variable (dependent variable)

Example 1: Rachael runs a concession stand at the park, where she sells water bottles. She keeps a list of each day's high temperature and the number of water bottles sold each day. Rachael is looking for trends that relate the daily high temperature to the number of water bottles she sells each day. She thinks the two variables might be related and wants to investigate possible trends using a scatterplot. Below is the list of her ordered pairs. Construct a scatterplot of the data using https://www.desmos.com/calculator.

(65, 102), (71 133), (79, 144), (80, 161), (86, 191), (86, 207), (91, 235), (95, 237), (100, 243)
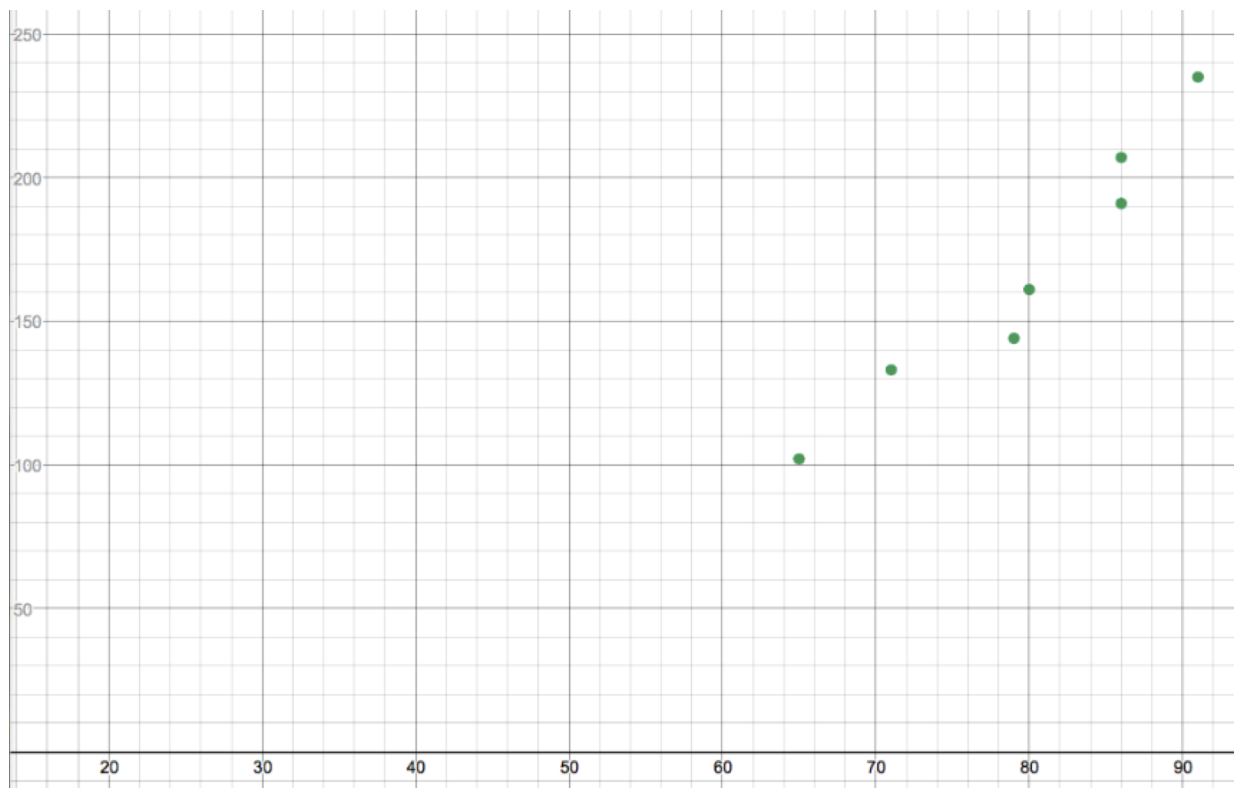
Example 2: Rachael now wants to interpret the trend in the scatterplot.

  a) What do you notice about the relationship between temperature and water bottle
     sales?

      Water bottle sales increase as the temperature rises. Because both variables are
      increasing, it is a *positive* correlation.

  b) What is the explanatory (independent) variable & response (dependent) variable?

      Because the temperature caused the number of water bottle sales, the
      temperature is the explanatory (independent) variable, and the number of water
      bottle sales is the response (dependent) variable.

Example 3: Determine if the scatterplot below depicts a positive correlation or a negative
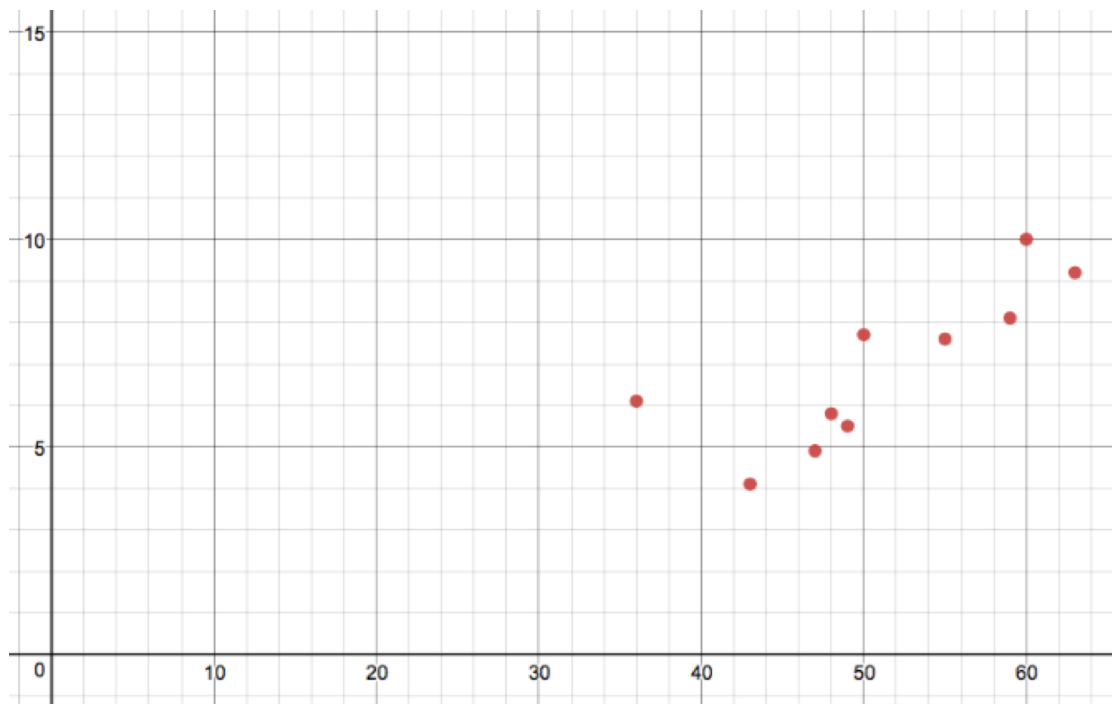correlation.
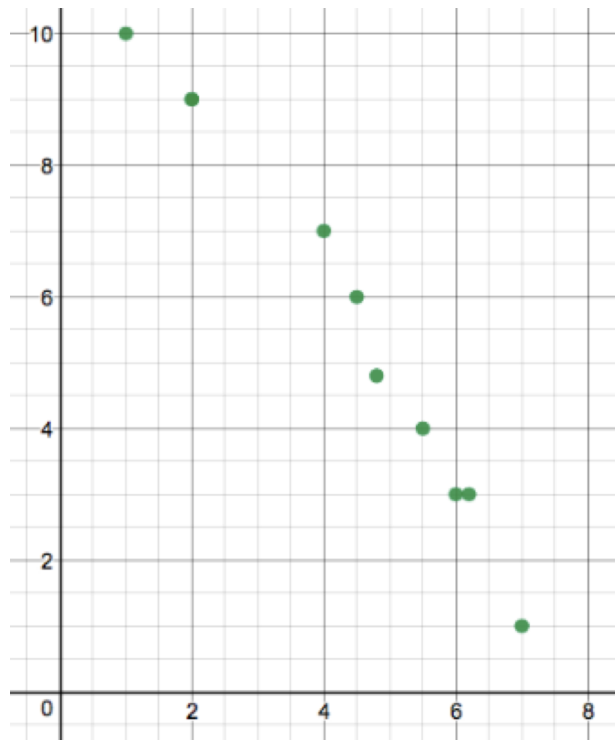
As the *x*-values increase, the *y*-values decrease. Since one goes up while the other goes, down,
this would be a *negative* correlation.

Example 4: An elementary school nurse compiled the following data about ten students in the table shown below.

Height (inches)	Reading Level
48	5.8
63	9.2
49	5.5
43	4.1
46	6.1
55	7.6
59	8.1
60	10.0
47	4.9
50	7.7

a) Create a scatterplot of the data using https://www.desmos.com/calculator.


b) Do you think a person's height causes a higher reading level?

The graph shows a positive correlation between the two variables, but it is unlikely that the child's height is the *cause* of the reading level.

Example 5: The scatterplot below shows the relationship between the number of text messages made by each of ten juniors while studying for a chemistry test and their scores on that test. Describe the trends you see in the data.
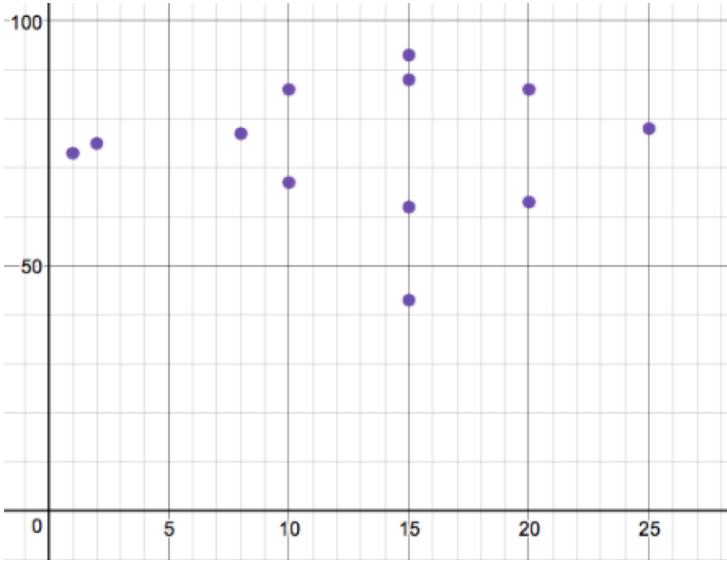
There is no trend in the data, so there is no correlation.