7.6 Scatter Plots

SWBAT draw scatter plots, identify positive and negative correlation, and distinguish between linear, quadratic, and exponential relationships.
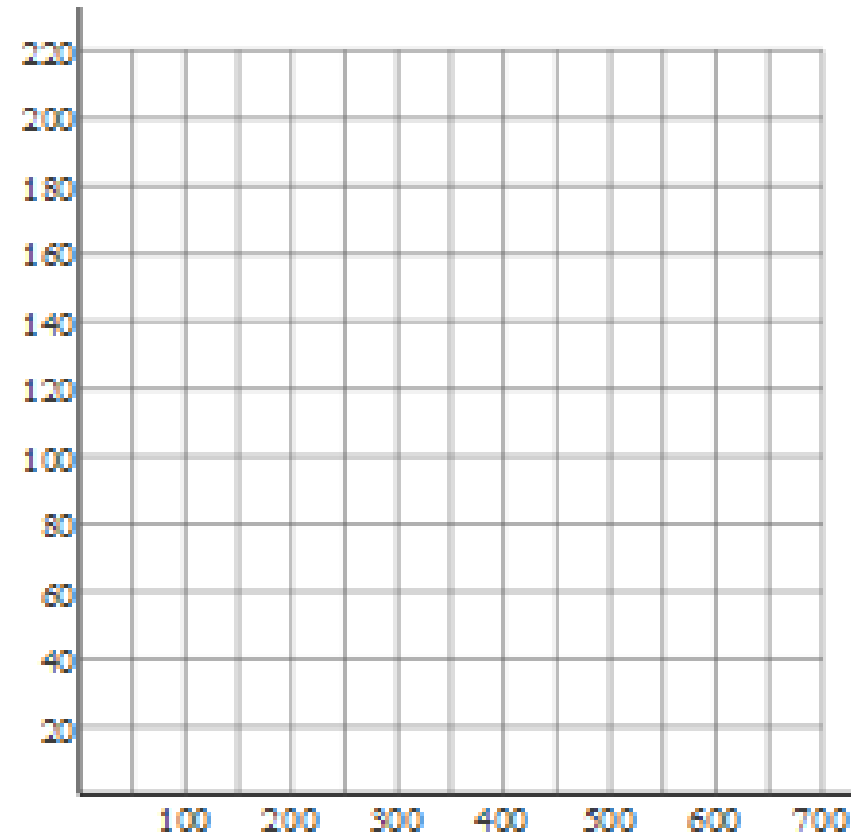
Assignments:

HW56

Scatter Plots

▶ Scatter Plots are graphs with a specific purpose – they are used to show a relationship between two variables. (For example, a relationship between height and weight).

▶ Plot the points just as you would any other point!
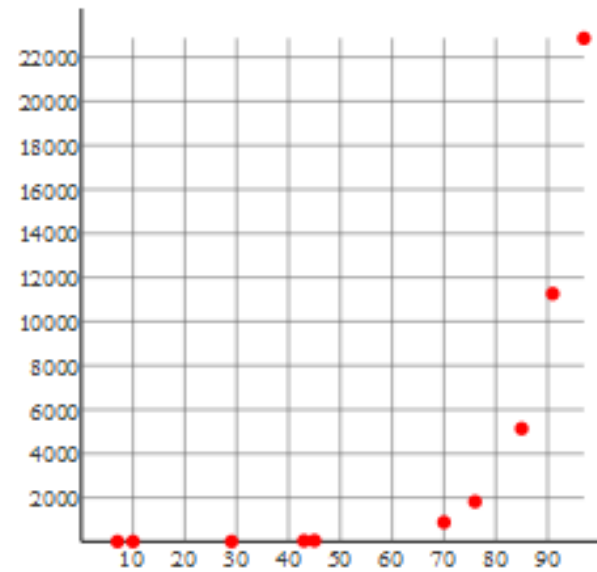
1)

X	Y
100	220
300	160
300	170
300	200

X	Y
400	100
500	120
500	120

X	Y
600	80
700	50
700	70

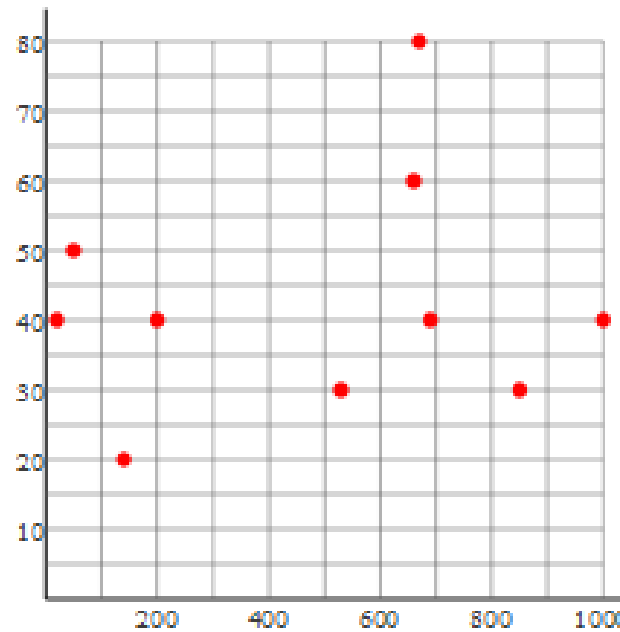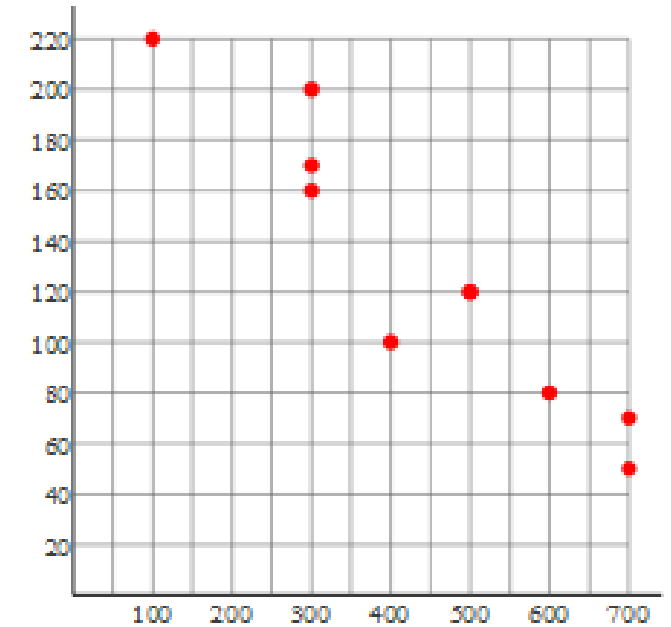# Scatter Plots: Correlation

▶ Positive Correlation: The points appear to be going in an upward direction.

▶ Negative Correlation: The points appear to be going in a downward direction

▶ No Correlation: The points are completely scattered.
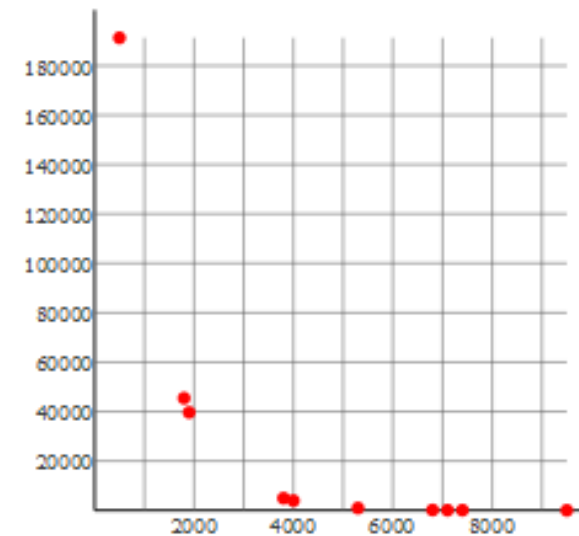

Positive correlation

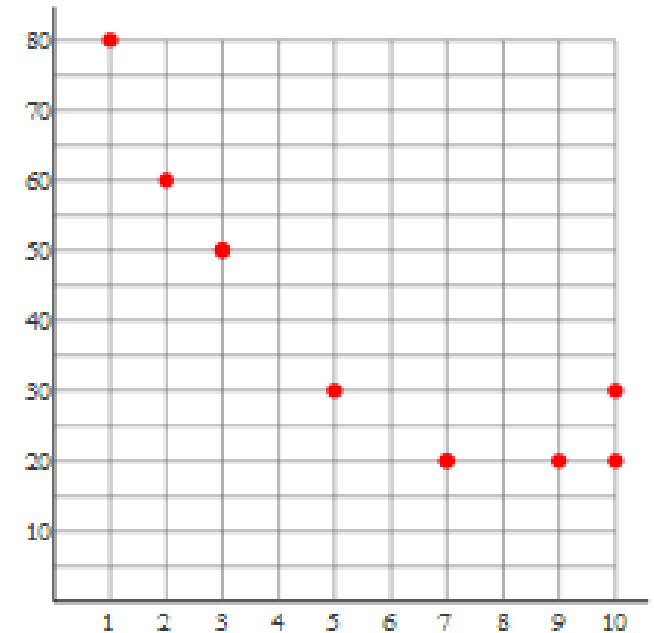Negative correlation

No correlation

Scatter Plots: Relationship

- If there is a correlation, relationships can be described as linear, quadratic, or exponential.

- If the points appear to be following a straight line, it's linear.

- If the points appear to be following a U shape, it's quadratic.

- If the points appear to be following a curve that flattens out along the x-axis, it's exponential.
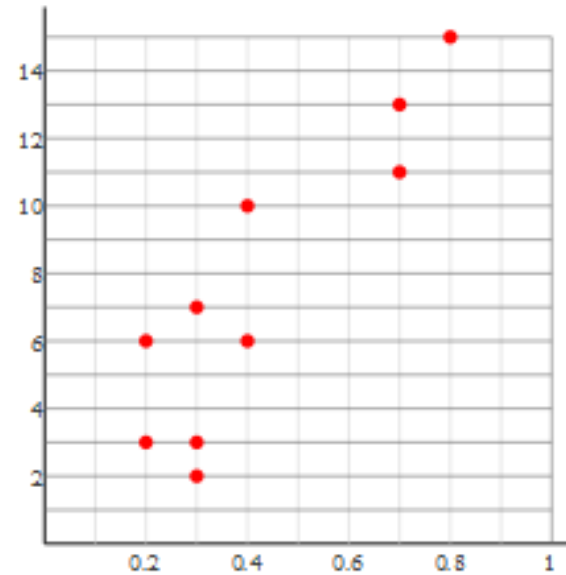

Positive correlation
Linear

Negative correlation
Quadratic

Negative correlation
Exponential

7.7 Linear Regression

SWBAT determine a line of best fit of a scatter plot.

Linear Regression

▶ When we have data that has a linear relationship, we can find a **line of best fit** that describes the direction the data is going.

▶ A line of best fit may not actually touch *any* of the points on your scatter plot – but it's close.

▶ Figuring out what the line of best fit is can be a little tricky. There are several methods that can be used to find a line of best fit by hand, but most involve at least a little estimation. The method we'll be focusing on is the *dividing method*.
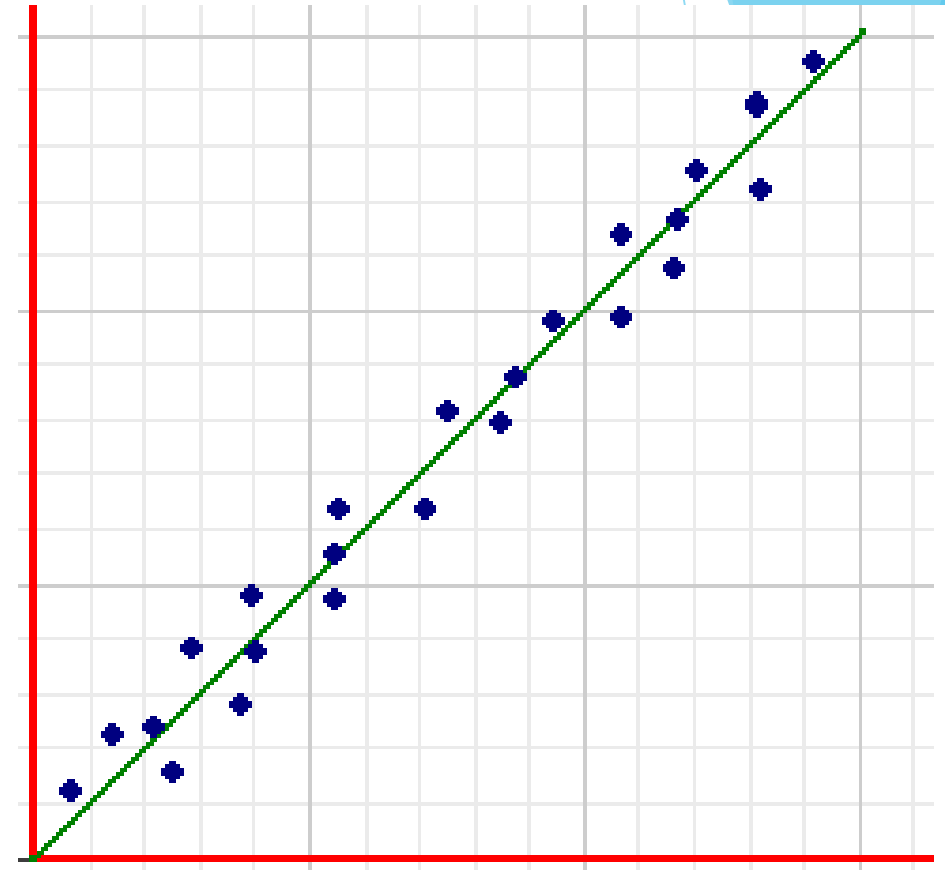
Line of Best Fit: Dividing Method

1)

X	Y
20	2.4
30	2
30	2
30	2.1

X	Y
50	1.4
60	0.8
60	1.2

X	Y
60	1.4
70	0.6
70	1.1

1. Draw a vertical line that separates the data into two even halves

2. Mark the center of the data on both sides

3. Draw a line connecting the marks

4. Find the equation of the line

It is also possible to find the line of best fit using a graphing calculator. Here's a YouTube video I found showing how that works on a TI-84: https://youtu.be/HTFtogVoLiw