Sections 9.1 and 9.2

Warm-up

1. In 2000, 15 billion pounds of avocados were consumed. In 2014, 37 billion pounds were consumed. Find the rate of change in avocado consumption over this period.

2. Let A be the annual U.S. consumption in billions of pounds of avocados at t years since 2000. Which variable is explanatory? Which is response?

3. Use the variables and the following information to find a linear model to represent the situation.

Year	Avocado Consumption
2000	15
2005	19
2010	28
2014	37
2015	40
2016	43.2
2017	45.36

4. Carefully make a scatterplot of the data set.

5. Carefully make sketch your linear model on the scatterplot.

6. Where does model breakdown occur? Why might that be?

7. Use two other points to find a different linear model. Write which points you use. Why do you think this model is better or worse?

A few notes

Recall $y = mx + b$ is the equation for a line where m is the slope and b is the y-intercept. How can we find the equation for a line if we know the slope and some other point?

Example 1. Find the equation of a line that has a slope of 3 and goes through the point $(4, -5)$.
Graph: too long and tedious. Algebraically

How can we find the equation for a line if we know two points?

Example 2. Find the equation for a line that passes through the points $(2, 3)$ and $(4, 7)$.

Some more practice

Example 3. Find the equation for the line that passes through the points $(1, 2)$ and $(3, 8)$.

A little discussion

How does this process differ from the opening example? Thinking about what we learned today in class so far, how can we generalize this process to a scatterplot?

Practicing our techniques

Example 4. The percentages of births (p) outside of marriage in the United States at t years since 1990 is given in the following table

Year	Percentage of Births Outside Marriage
1990	28.0
1995	32.2
2000	33.2
2005	36.9
2010	40.8
2013	40.6

1. Construct a scatterplot
2. Describe the 4 characteristics of the association, including r.
3. Find an equation of a linear model
4. Graph the line on the scatter plot and verify that the points you chose the line goes through.
5. When you calculated r, the graphing calculator also came up with a value for a and b. Discuss with your table what these values could be.