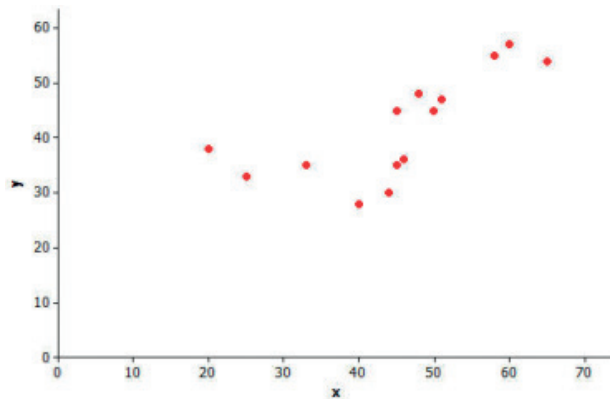NAME: _____ PERIOD: _____ DATE: _____
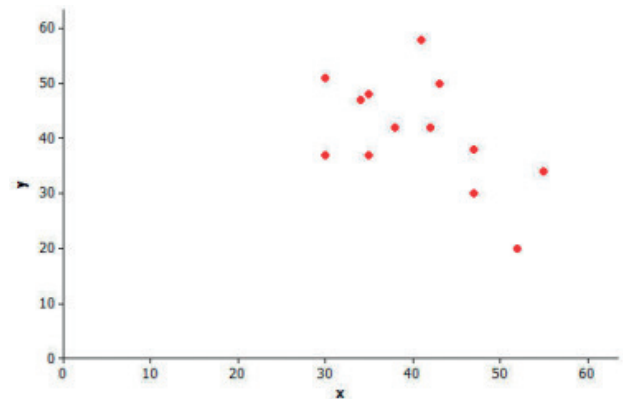
Homework Problem Set

1. Which of the three scatter plots below shows the strongest linear relationship? Which shows the weakest linear relationship?
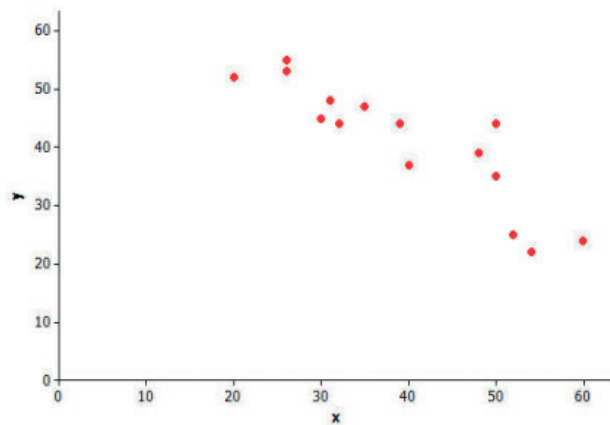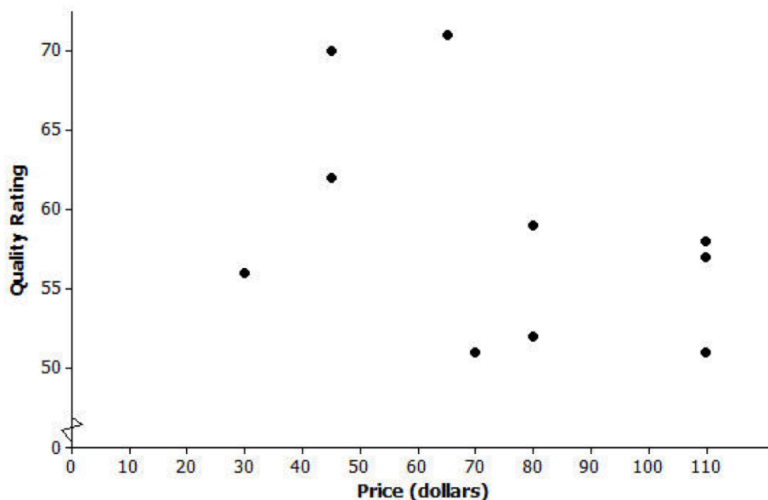
Scatter Plot 1

Scatter Plot 2

Scatter Plot 3

Strongest ⟶ plot 3 (negative)

weakest ⟶ plot 2.

2. *Consumer Reports* published data on the price (in dollars) and quality rating (on a scale of 0 to 100) for 10 different brands of men's athletic shoes.

Price ($)	Quality Rating
65	71
45	70
45	62
80	59
110	58
110	57
30	56
80	52
110	51
70	51

A. Construct a scatter plot of these data using the grid provided.

See graph

B. Calculate the value of the correlation coefficient between price and quality rating, and interpret this value. Round to the nearest hundredth. (Use a graphing utility to find the correlation coefficient.)

* use DESMOS $r \approx -0.42$ *Moderate negative relationship*

C. Does it surprise you that the value of the correlation coefficient is negative? Explain why or why not.

yes, as the price increases, the quality rating should be higher.

D.   Is it reasonable to conclude that higher-priced shoes are higher quality? Explain.

Based on this data, no.

E.   The correlation between price and quality rating is negative. Is it reasonable to conclude that increasing the price causes a decrease in quality rating? Explain.

No, the higher price does not cause lower quality rating.
There is no cause-and-effect.

3.   *The Princeton Review* publishes information about colleges and universities. The data below are for six public 4-year colleges in New York. Graduation rate is the percentage of students who graduate within six years. Student-to-faculty ratio is the number of students per full-time faculty member.

School	Number of Full-Time Students	Student-to-Faculty Ratio	Graduation Rate
CUNY Bernard M. Baruch College	11,477	17	63
CUNY Brooklyn College	9,876	15.3	48
CUNY City College	10,047	13.1	40
SUNY at Albany	14,013	19.5	64
SUNY at Binghamton	13,031	20	77
SUNY College at Buffalo	9,398	14.1	47

A.   Calculate the value of the correlation coefficient between the number of full-time students and graduation rate. Round to the nearest hundredth.

Use DESMOS   *r ≈ 0.83*

B. Is the linear relationship between graduation rate and number of full-time students weak, moderate, or strong? On what did you base your decision?

Based on the table, the relationship is strong

C. Is the following statement true or false? Based on the value of the correlation coefficient, it is reasonable to conclude that having a larger number of students at a school is the cause of a higher graduation rate.

False, the cause & effect relationship cannot be assumed.

D. Calculate the value of the correlation coefficient between the student-to-faculty ratio and the graduation rate. Round to the nearest hundredth.

✳ Use DESMOS   r ≈ 0.95

E. Which linear relationship is stronger: graduation rate and number of full-time students or graduation rate and student-to-faculty ratio? Justify your choice.

Graduation rate & student to faculty ratio.

→ Stronger correlation coefficient.