Algebra 1
Day 6: Linear Regression
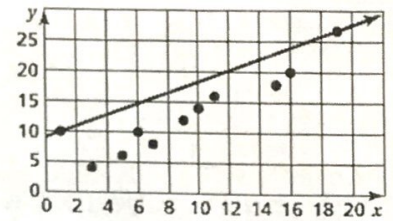Practice Assignment

Unit 11: Comparing Functions

Name: _Key_

Practice

1. Describe and correct the error found in the example to the right about drawing a line of best fit.

✗

the line should go through as many points as possible and have points above and below the line.

2. The table shows the average and maximum longevity of various animals in captivity.

Longevity (years)								
Avg.	12	25	15	8	35	40	41	20
Max.	47	50	40	20	70	77	61	54

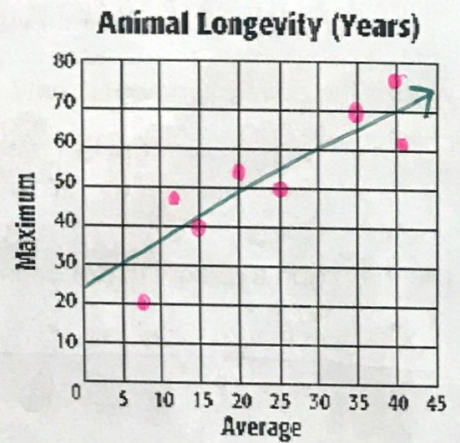a. Draw a scatterplot and determine, what relationship, if any, exists in the data.

there seems to exist a strong and positive relationship between average and maximum longevity.

b. Draw a line of best fit and find the equation of the line.

$a = 1.22$ $b = 22.45$ $r = .88$

$$y = 1.22x + 22.45$$

correlation coefficient : $r = .88$

Animal Longevity (Years)

3. The table at the right gives the number of hours spent studying for a science exam and the final grade.

a. Draw a scatterplot and draw in the line of best fit.

Study Hours	3	2	5	1	0	4	3
Grade	84	77	92	70	60	90	75

b. What is the equation for the line of best fit? What is the correlation coefficient? What does it tell you about your linear model?

$y = 6.3x + 62$ $r = .96$

There is a strong positive relationship between studying and your grade.
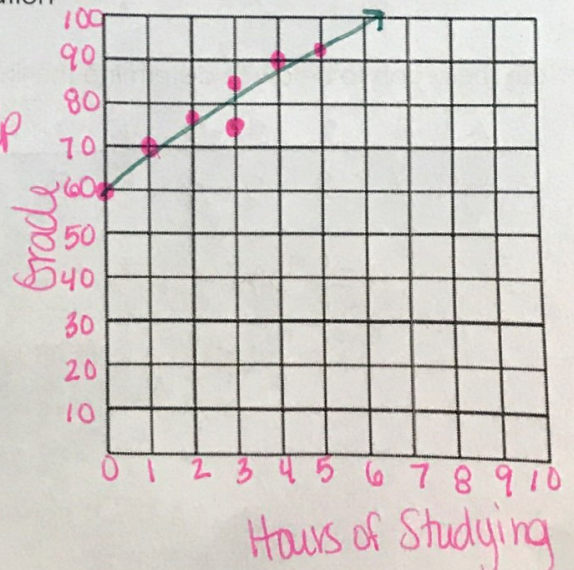
c. Predict the grade of a student who studied for 6 hours.

$\approx 98\%$

d. What does the slope and y-intercept mean in context of the problem?

Slope: For every hour of studying, you can expect a grade to increase 6.3 points.

y-int: If you don't study at all, you can expect to earn a 62.

Grade (vertical axis), **Hours of Studying** (horizontal axis)

4. **These are the asking prices for some used Toyota Corolla's in newspaper classifieds in 2006 (t = 0).** How old car is compared to

a. Using your calculator, calculate a model to represent the data to the left (Round numbers to the nearest whole number).

Model Year		Asking Price 2006
2004	2	$10,950
2003	3	$9,400
2001	5	$8,990
1998	8	$5,800
1997	9	$5,850
1994	12	$3,800
1989	17	$1,500

$$y = -626x + 11619$$

b. What is the slope of the line you found in Part A? What does that number represent in context of the problem?

Slope : -626

A car loses $626 of value each year.

c. What is the y-intercept of the line in Part A? What does that number represent in context of the problem?

y-intercept : 11,619

when the car was brand new, it was worth $11,619.

d. What is the correlation coefficient? What does this tell you about the linear model you found?

r = -.99   There is a strong negative relationship between age of the car and its value (the older the car, the less value it has).

6. Use the graph to below to determine the linear regression and correlation coefficient.

X	0	1	2	3	4	5	6	8	9
y	9	7	7	6	5	6	4	3	2

$$y = 0.7x + 8.3$$

r = -.97 (strong, negative relationship)
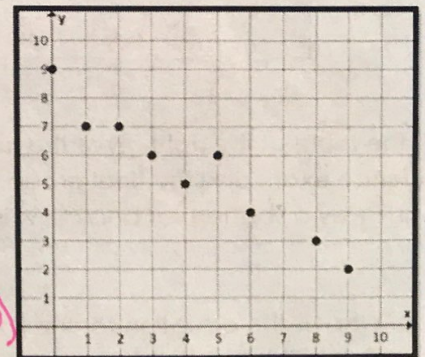
7. Use the graph to below to determine the linear regression and correlation coefficient.

X	1	3	4	5	6	8	9
y	2	3	3	4	5	5	6

$$y = 0.5x + 1.5$$

r = .97 (strong, positive relationship)