Name: _*Answer Key*_   Date: _____

Scatter Plots and Line of Best Fit – TV Task

MCC9-12.S.ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
MCC9-12.S.ID.6a Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use the given functions or choose a function suggested by the context. Emphasize linear and exponential models.
MCC9-12.S.ID.6c Fit a linear function for a scatter plot that suggests a linear association.

1. Students in Ms. Garth's Algebra II class wanted to see if there are correlations between test scores and height and between test scores and time spent watching television. Before the students began collecting data, Ms. Garth asked them to predict what the data would reveal. Answer the following questions that Ms. Garth asked her class.

   a. Do you think students' heights will be correlated to their test grades? If you think a correlation will be found, will it be a positive or negative correlation? Will it be a strong or weak correlation? *No - I don't think there will be a correlation between height + test grades.*

   b. Do you think the average number of hours students watch television per week will be correlated to their test grades? If you think a correlation will be found, will it be a positive or negative correlation? Will it be a strong or weak correlation? Do watching TV and low test grades have a cause and effect relationship? *Yes - I think there will be a correlation between watching TV + test grades. The more TV you watch, the lower your test grades will be - so negative correlation. It should be strong. Watching TV doesn't cause poor grades, so no causation*

2. The students then created a table in which they recorded each student's height, average number of hours per week spent watching television (measured over a four-week period), and scores on two tests. Use the actual data collected by the students in Ms. Garth's class, as shown in the table below, to answer the following questions.

r = 0.38

Student	1	2	3	4	5	6	7	8	9	10	11	12	13
Height (in inches)	60	65	51	76	66	72	59	58	70	67	65	71	58
TV hrs/week (average)	30	12	30	20	10	20	15	12	15	11	16	20	19
Test 1	60	80	65	85	100	78	75	95	75	90	90	80	75
Avg	65	82.5	70	85	100	83	80	92.5	82.5	90	92.5	82.5	80
Test 2	70	85	75	85	100	88	85	90	90	90	95	85	85

   a. Which pairs of variables seem to have a positive correlation? Explain.
   Height vs Test Avg (r = 0.38 - very weak)

   b. Which pairs of variables seem to have a negative correlation? Explain.
   TV hrs/wk vs. Test Avg (r = -0.85 - strong)

   c. Which pairs of variables seem to have no correlation? Explain.
   Height vs. TV hrs/wk (r = -0.28 - close to 0)
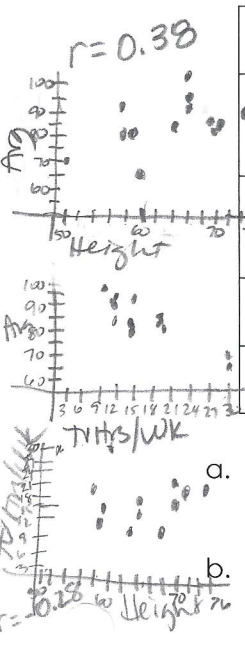
3. Using the statistical functions of your graphing calculator, determine a line of good fit for each of the following categories.

     a. Score on Test 1 versus hours watching television:

$$y = -0.47x + 55.50$$

     b. Score on test 1 versus score on test 2:

$$y = 0.60x + 37.83$$

     c. Hours watching television versus score on test 2:

$$y = -1.00x + 104.14$$

made a 55 on Test 1

4. Use your answer to 3b to predict the test 2 score of someone who ~~watches tv for 40 hours per week.~~

$$y = 0.60(55) + 37.83 = \boxed{70.83}$$

5. Use your answer to 3c to predict the test 2 score of someone who watches tv for 5 hours per week.

$$y = -1(5) + 104.14 = \boxed{99.14}$$