

Lesson #6 B: Understanding Line of Best Fit and Applying Linear Regression-Review
(Reference: Lesson #45 in book)**Problem**

1. For each of the following problems, plot all of the given points on a coordinate plane and find the equation of a line of best fit using Linear Regression and then use that line of best fit to predict the results of the given questions at the end of each problem.

1.

X	Y
3	6
3	7
3	9
4	3
4	6
4	9
5	1
5	3
6	5
6	7
7	1

EQUATION OF THE LINE OF BEST FIT:

Use the Equation of the LINE OF BEST FIT to predict the following coordinate points:

- (1,)
(10,)
(, 15)
(, 27)

2.

X	Y
2	2
2	4
3	3
4	2
6	4
6	5
7	2
8	4
8	7
10	5
10	6

EQUATION OF THE LINE OF BEST FIT:

Use the Equation of the LINE OF BEST FIT to predict the following coordinate points:

(4,)

(18,)

(, 10)

(, 20)

3.

X	Y
3	1
3	3
4	1
4	7
5	5
5	8
6	3
6	6
6	7
7	10
8	8

EQUATION OF THE LINE OF BEST FIT:

Use the Equation of the LINE OF BEST FIT to predict the following coordinate points:

(2,)

(10,)

(, -3)

(, -11)

4.

X	Y
3	9
3	10
4	8
5	6
6	8
7	7
8	9
9	6
10	7
11	7
12	6

EQUATION OF THE LINE OF BEST FIT:

Use the Equation of the LINE OF BEST FIT to predict the following coordinate points:

(18,)

(24,)

(, 12)

(, 18)

5. For each of the following scenerios use your graphing calculator to find the line of best fit or the equation of the regression line, the correlation coefficient, explain the results, and answer the prediction question for each of the scenerios.

5. Enrollment at a fitness center for the years 2000 through 2007 are shown below. Find the regression line that best models the data, find the correlation coefficient and explain what you see in the data and what the slope of the regression equation means. Use the regression line to predict the enrollment in the year 2012.

<u>YEAR</u>	<u>TOTAL ENROLLMENT</u>
2000	310
2001	295
2002	412
2003	488
2004	322
2005	592
2006	514
2007	522

6. A particular bicycle store bases their bicycle prices off of the bicycles weight (lbs.) The data below is the prices and weights of the current bicycles they have in stock. Find the regression line that best models the data, find the correlation coefficient and explain what you see in the data and what the slope of the regression equation means. Then predict what the prices should be for a couple of new models of bikes that just got shipped to the store that weigh 30.2 lbs and 22.0 lbs.

<u>PRICE</u>	<u>WEIGHT(lbs.)</u>
650	21.1
710	20.4
490	38.4
330	41.3
650	29.9
535	29.5
4500	14.2
5610	15.6
2200	26.9

7. As Earth's population continues to grow, the solid waste generated by the population grows with it. Governments must plan for disposal and recycling of ever growing amounts of solid waste. Planners can use data from the past to predict future waste generation and plan for enough facilities for disposing of and recycling the waste. The following data deals with the amount of waste generated in Florida from years 1990-1994. Find the regression line that best models the data, find the correlation coefficient and explain what you see in the data and what the slope of the regression equation means. Use the regression line to predict the amount of waste generated in the 2005 and in what year they will generate a total of 30,000 tons of waste?

<u>YEAR</u>	<u>WASTE (TONS)</u>
1990	19,358
1991	19,484
1992	20,293
1993	21,489
1994	23,561

8. Olympic Athletes and their performances have been getting better and better over the years with the increase in training and understanding of how to train athletes. In anticipation of this, a few athletic training facilities have been trying to prepare their athletes based on what they believe will be the future World Record times. The World Record times (in minutes) in the women's 400-meter freestyle swimming event in the Olympics from 1936 to 1996 are given below. Find the regression line that best models the data, find the correlation coefficient and explain what you see in the data and what the slope of the regression equation means. Use the regression line to predict the World Record time in the 2004 and 2008 Olympics so the training facilities could prepare a training plan to properly prepare their athletes to win gold?

<u>YEAR</u>	<u>TIME (MINS)</u>
1936	5.44
1948	5.30
1952	5.20
1956	4.91
1960	4.84
1964	4.72
1968	4.53
1972	4.32
1976	4.16
1980	4.15
1984	4.12
1988	4.06
1992	4.12
1996	4.12