Name: _____ Date: _____
AQR Period: _____

LINEAR REGRESSION PRACTICE

1) The accompanying table shows the enrollment of a preschool from 1980 through 2000. Write a linear regression equation to model the data in the table.

Year (x)	Enrollment (y)
1980	14
1985	20
1990	22
1995	28
2000	37

2) The accompanying table shows the percent of the adult population that married before age 25 in several different years. Using the year as the independent variable, find the linear regression equation.

Year (x)	Percent (y)
1971	42.4
1976	37.4
1980	37.1
1984	34.1
1989	32.1
1993	28.8
1997	25.7
2000	25.5

a) Round the regression coefficients to the *nearest hundredth*.

b) Using the equation found above, estimate the percent of the adult population in the year 2009 that will marry before age 25, and round to the *nearest tenth of a percent*.

3) A factory is producing and stockpiling metal sheets to be shipped to an automobile manufacturing plant. The factory ships only when there is a minimum of 2,050 sheets in stock. The accompanying table shows the day, x, and the number of sheets in stock, $f(x)$.

Day (x)	Sheets in Stock ($f(x)$)
1	860
2	930
3	1000
4	1150
5	1200
6	1360

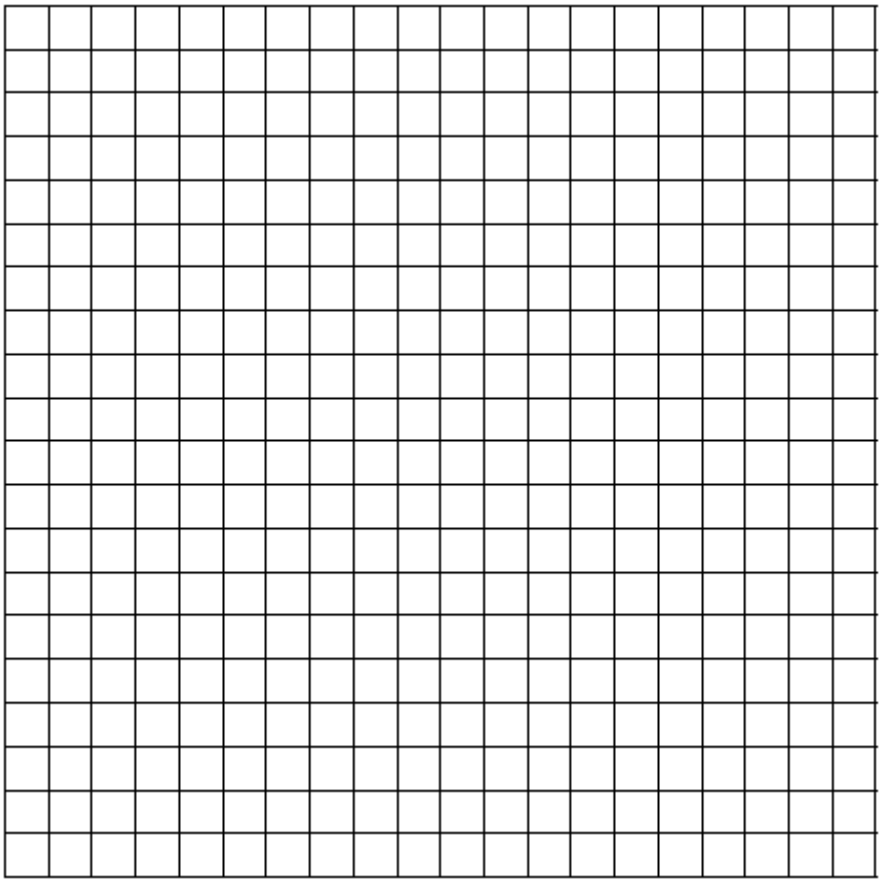
a) Write the linear regression equation for this set of data, rounding the coefficients to *four decimal places.*

b) Use this equation to determine the day the sheets will be shipped.

4) Two different tests were designed to measure understanding of a topic. The two tests were given to ten students with the following results:

Test x	75	78	88	92	95	67	58	72	74	81
Test y	81	73	85	88	89	73	66	75	70	78

a) Construct a scatter plot for these scores and sketch a line of best fit.



b) Write an equation for the line of best fit (round slope and intercept to the *nearest hundredth*).

b) Predict the score, to the *nearest integer*, on test *y* for a student who scored 87 on test *x*.

5) Since 1990, fireworks usage nationwide has grown, as shown in the accompanying table, where *t* represents the number of years since 1990, and *p* represents the fireworks usage per year, in millions of pounds.

Number of Years Since 1990 (*t*)	0	2	4	6	7	8	9	11
Fireworks Usage per Year, in Millions of Pounds (*p*)	67.6	88.8	119.0	120.1	132.5	118.3	159.2	161.6

a) Find the equation of the linear regression model for this set of data, where *t* is the independent variable. Round values to *four decimal places.*

b) Using this equation, determine in what year fireworks usage would have reached 99 million pounds.

c) Based on this linear model, how many millions of pounds of fireworks would be used in the year 2008? Round your answer to the *nearest tenth*.

6) The accompanying table illustrates the number of movie theaters showing a popular film and the film's weekly gross earnings, in millions of dollars.

Number of Theaters (x)	443	455	493	530	569	657	723	1,064
Gross Earnings (y) (millions of dollars)	2.57	2.65	3.73	4.05	4.76	4.76	5.15	9.35

a) Write the linear regression equation for this set of data, rounding values to *five decimal places.*

b) Using this linear regression equation, find the approximate gross earnings, in millions of dollars, generated by 610 theaters. Round your answer to *two decimal places.*

c) Find the minimum number of theaters that would generate at least 7.65 million dollars in gross earnings in one week.

7) The following chart shows the distance from New City and the median housing prices in those regions.

Distance from New City (mi.)	Median home price (in $1000s)
12	390
15	400
28	310
20	290
5	410
9	400
25	300
2	490
13	370
10	350
18	320
8	400

a) Write the linear regression equation for this set of data, rounding values to *the thousandths decimal place.*

b) Use the linear model to predict the median housing prices in a region 33 miles from New York City.