

For each of the following, perform linear, quadratic, and exponential regressions. Identify the type of regression with the best fit, and answer the question using the type of regression that best fits the data. Round r to the nearest 3 decimal places.

1) The table shows how the average age of the first marriage of Japanese women varied in the last half of the 20th century.

Year	Average Age	Year	Average Age
1950	23.0	1975	24.7
1955	23.8	1980	25.2
1960	24.4	1985	25.5
1965	24.5	1990	25.9
1970	24.2	1995	26.3

Estimate the average age of the first marriage of Japanese women in 2014.

Linear Correlation Coefficient: _____ Average Age: _____

Quadratic Correlation Coefficient: _____

Exponential Correlation Coefficient: _____ Best Fit: _____

2) Modern medical practice tells us not to encourage babies to become too fat. Is there a correlation between the weight, x , of a 1 year old, and the height, y , of the same person at 30 years old? A random sample of medical files produces the following information for 14 female patients:

X	21	25	23	24	20	15	25	21	17	24	26	22	18	19
Y	170	125	120	125	130	120	165	130	130	130	120	130	110	115

If a female baby weighs 20 lbs as a 1-year old, what do you predict she will weigh at 30?

Linear Correlation Coefficient: _____ Weight at 30: _____

Quadratic Correlation Coefficient: _____

Exponential Correlation Coefficient: _____ Best Fit: _____

3. The table below shows the lengths and corresponding ideal weights of sand sharks.

Length	60	62	64	66	68	70	72
Weight	105	114	124	131	139	149	158

Predict the weight of a sand shark whose length is 75 inches.

Linear Correlation Coefficient: _____ Weight expected _____

Quadratic Correlation Coefficient: _____

Exponential Correlation Coefficient: _____ Best Fit: _____

4. The table below gives the height and shoe sizes of six randomly selected men.

Height	67	70	73.5	75	78	66
Shoe size	8.5	9.5	11	12	13	8

If a man has a shoe size of 10.5, what would be his predicted height?

Linear Correlation Coefficient: _____ Height expected _____

Quadratic Correlation Coefficient: _____

Exponential Correlation Coefficient: _____ Best Fit: _____

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1. A student who waits on tables at a restaurant recorded the cost of meals and the tip left by single diners.

Meal Cost	\$4.75	\$6.84	\$12.52	\$20.42	\$8.97
Tip	\$0.50	\$0.90	\$1.50	\$3.00	\$1.00

If the next diner orders a meal costing \$10.50, how much tip should the waiter expect to receive?

Linear Correlation Coefficient: _____ Tip expected _____

Quadratic Correlation Coefficient: _____

Exponential Correlation Coefficient: _____ Best Fit: _____

2. The table below gives the number of hours spent studying for a science exam (x) and the final exam grade (y).

X	2	5	1	0	4	2	3
Y	77	92	70	63	90	75	84

Predict the exam grade of a student who studied for 6 hours.

Linear Correlation Coefficient: _____ Grade expected _____

Quadratic Correlation Coefficient: _____

Exponential Correlation Coefficient: _____ Best Fit: _____

Name: _____ JMJ Date: _____

Period: _____ Regression Analysis Mr. Casalnuovo

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At the local arcade, the most popular video game is Cosmic Blaster. Joshua decides to observe new game players using the machine every half hour and record their highest scores.

a.) Find the best equation to model the data.

Linear Correlation Coefficient: _____

Quadratic Correlation Coefficient: _____

Exponential Correlation Coefficient: _____

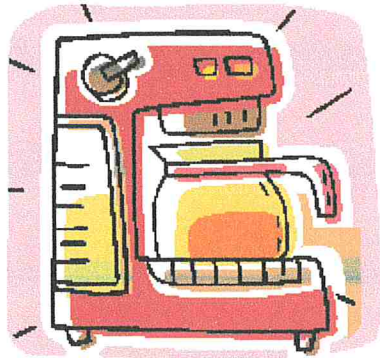
Best Fit: _____

b.) According to your model, what score would most likely be observed at 8:15 pm? *Answer to the nearest integer.*

c.) Joshua makes the assumption that the more expert players use the machine later in the evening. Does the data support this hypothesis?

Time	Score
4 pm	950
4:30 pm	1001
5 pm	1450
5:30 pm	1503
6 pm	1605
6:30 pm	3002
7 pm	2668
7:30 pm	2860
8 pm	3250
8:30 pm	3945
9 pm	4720
9:30 pm	4866
10 pm	5509

2) **Data:** The data at the right shows the cooling temperatures of a freshly brewed cup of coffee after it is poured from the brewing pot into a serving cup. The brewing pot temperature is approximately 180° F.



Time (mins)	Temp (° F)
0	179.5
5	168.7
8	158.1
11	149.2
15	141.7
18	134.6
22	125.4
25	123.5
30	116.3
34	113.2
38	109.1
42	105.7
45	102.2
50	100.5

a.) Find the best equation to model the data.

Linear Correlation Coefficient: _____

Quadratic Correlation Coefficient: _____

Exponential Correlation Coefficient: _____

Best Fit: _____

Based upon the best equation:

What was the initial temperature of the coffee? _____

When is the coffee at a temperature of 106 degrees? _____

What is the predicted temperature of the coffee after 1 hour? _____

In 1992, a woman sued McDonald's for serving coffee at a temperature of 180° that caused her to be severely burned when the coffee spilled. An expert witness at the trial testified that liquids at 180° will cause a full thickness burn to human skin in two to seven seconds. It was stated that had the coffee been served at 155°, the liquid would have cooled and avoided the serious burns. The woman was awarded over 2.7 million dollars. As a result of this famous case, many restaurants now serve coffee at a temperature around 155°. How long should restaurants wait (after pouring the coffee from the pot) before serving coffee, to ensure that the coffee is not hotter _____ than 155° ?

If the temperature in the room is 76° F, what will happen to the temperature of the coffee, after being poured from the pot, over an _____ extended period of time?