

Math 225 final exam study guide

- 1.) Below are the three types of scatter plots that can occur in a graph.



Positive linear pattern with deviations, we can see that as the X-values decrease, the Y-values increase. So it is a positive relationship. But there are points that deviate from the positive linear pattern, so it is a weaker pattern, instead of a strong one.



Negative linear pattern with deviations, we can see that as the X-values increase, the Y-values decrease. So it is a negative relationship. But there are points that deviate from the negative linear pattern, so it is a weaker pattern, instead of a strong one.



No pattern, we see that the points are all over, so no pattern can be determined.

2.)

Given the table below, what would the regression equation be?

x	y
150	10
180	19
200	25
225	36

EXPLANATION

Enter the data in excel and select data, select scatter plot chart, select data in chart and ask it to make regression line and include equation. Or you can go to

<https://www.easycalculation.com/statistics/regression.php>

and enter data in and write equation from what it gives you.

Equation is $y = 0.342x - 42.05$

3.)

Suppose you computed $r = -0.745$ using $n = 25$ data points. Using the critical values table below, determine if the value of r is significant or not.

df	CV (+ and -)	df	CV (+ and -)	df	CV (+ and -)	df	CV (+ and -)
1	0.997	11	0.555	21	0.413	40	0.304
2	0.950	12	0.532	22	0.404	50	0.273
3	0.878	13	0.514	23	0.396	60	0.250
4	0.811	14	0.497	24	0.388	70	0.232
5	0.754	15	0.482	25	0.381	80	0.217
6	0.707	16	0.468	26	0.374	90	0.205
7	0.666	17	0.456	27	0.367	100	0.195
8	0.632	18	0.444	28	0.361		
9	0.602	19	0.433	29	0.355		
10	0.576	20	0.423	30	0.349		

EXPLANATION

There are $n-2 = 25-2 = 23$ degrees of freedom. Looking at the table of critical values, the critical values corresponding to $df = 23$ are -0.396 and 0.396 . Since the value of r is less than -0.396 , r is significant. So we could say, **r is significant because it is not between the positive and negative critical values.** If r equaled a value between these critical values then we would say r is not significant because it is between the positive and negative critical values.

4.) Brandon is studying the relationship between the time spent sewing a blanket per day and the length put on the blanket in millimeters per day and has collected the data shown in the table. The line of best fit for the data is $y = 0.342x - 42.05$. Assume the line of best fit is significant and there is a strong linear relationship between the variables.

X=time spent sewing blanket	Y=time till blanket is finished
150	10
180	19
200	25
225	36

According to the line of best fit, what would be the predicted length of the millimeters for someone who spent 175 minutes sewing? Round your answer to two decimal places, as needed.

Explanation

Substitute 175 for x into the line of best fit to estimate the length in millimeters for someone who spent 175 minutes sewing: $y = 0.342(175) - 42.05 = 17.8$ millimeters.

5.) A scientific experiment on skingrowth gives the following data table.

x	y
78	49
84	63
92	85
84	108
93	122

The least squares regression line was found. Using technology, it was determined that the total sum of squares (SST) was 5968.8 and the sum of squares of regression (SSR) was 5593.7 . Calculate R^2 , rounded to three decimal places.

EXPLANATION

$$R^2 = \frac{SSR}{SST}$$

$$R^2 = \frac{5593.7}{5968.8}$$

$$R^2 = 0.937$$

6.) The data is provided below. Use Excel to calculate the correlation coefficient r between the two data sets. Round your answer to two decimal places.

x	y
340	209
345	215
378	234
375	208
356	215
322	239
345	256
358	289
360	219

EXPLANATION

The correlation coefficient can be calculated easily with Excel using the built-in CORREL function.