

Do Now

The term "snowstorms of note" applies to all snowfalls over 6 inches. The snowfall amounts for snowstorms of note in Utica, New York, over a four-year period are as follows:

7.1, 9.2, 8.0, 6.1, 14.4, 8.5, 6.1, 6.8, 7.7,
21.5, 6.7, 9.0, 8.4, 7.0, 11.5, 14.1, 9.5, 8.6

What are the mean and population standard deviation for these data, to the nearest hundredth?

$$\bar{X} = 9.46$$

$$\sigma_x = 3.74$$

May 9-7:43 AM

HW Answers

- (a) $r = -0.56$, weak negative (d) $r = 0$, no correlation
 (b) $r = 0.93$, strong positive (e) $r = -0.82$, moderate negative
 (c) $r = 1.0$, perfect positive (f) $r = 0.35$, weak positive
- (a) 51.65 kilowatt hours
 (b) 13.3 hours
 (c) Weak positive because it's closer to 0 than 1
 (d) No because the correlation is very weak
 (e) Weather issues - could be cloudy days/snow on solar panels blocking sunlight

May 19-9:25 AM

Residuals

- Tells us whether the model is appropriate
- the difference between the observed value of the dependent variable (y) and the predicted value (\hat{y}) is called the residual (e). Each data point has one residual.
- Observed Value - Predicted Value

*original y-value
Scatter Plot
Table of Values*

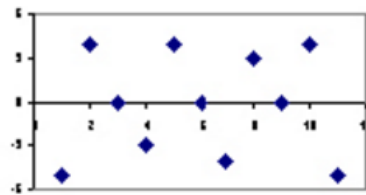
*Line of Best Fit
Regression Equation*

May 24-12:33 PM

Residual Graphs

Random Pattern

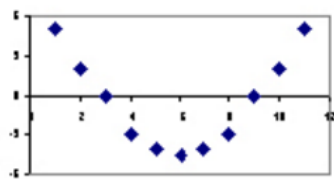
-Good fit for a linear model



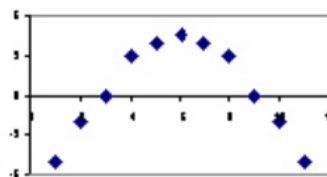
Random pattern

Non-Random Pattern

-suggesting a better fit for a non-linear model.



Non-random: U-shaped curve



Non-random: Inverted U

May 24-12:40 PM

Exercise #1: A skydiver jumps from an airplane and an attached micro-computer records the time and speed of the diver for the first 12 seconds of the diver's freefall. The data is shown in the table below.

Time (sec) X	0	2	4	6	8	10	12
Speed (ft/sec) Y	0	25	46	60	68	72	74

(a) Find the equation for the line of best fit for this data set. Round both coefficients to the nearest *tenth*. As well, determine the correlation coefficient and round it to the nearest *hundredth*. Based on the correlation coefficient, characterize the fit as positive or negative and how strong of a fit it is. On Your Calculator create a plot with both the data and line of best fit shown on it.

$y = ax + b$
 $a = 6.04$
 $b = 13.07$
 $r^2 = x$
 $r = .939...$

Line of Best Fit

$y = 6.0x + 13.1$

Correlation Coefficient = 0.94

Strong Positive Fit

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(b) Using tables on your calculator fill in the table below with the predicted values (rounded to the nearest integer) and the residuals for each data point.

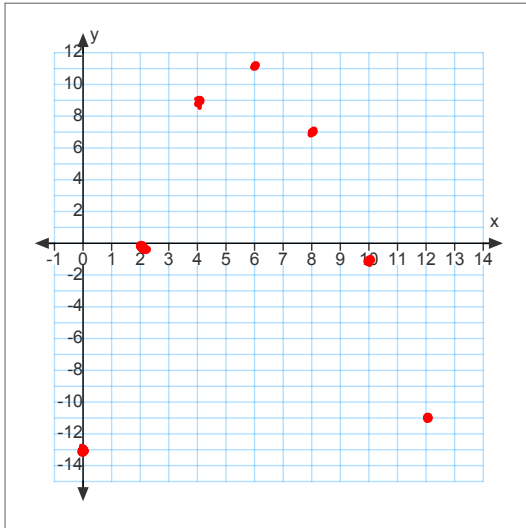
Time (sec) X	0	2	4	6	8	10	12
Speed (ft/sec)	0	25	46	60	68	72	74
Prediction (ft/sec)	13	25	37	49	61	73	85
Residual (ft/sec)	-13	0	9	11	7	-1	-11

$y = 6.0x + 13.1$

To Find Predicted Values
 Equation
 2nd Table
 Graph

May 16-1:29 PM

(c) Sketch a plot of the residuals below.



(d) Do the residuals show any distinct pattern?

Yes, they have a distinct pattern. This would indicate that the linear model is not appropriate. Another model such as exponential or quadratic would be better.

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