

Notes on Residuals

Name Key

Class Period _____

THE BASICS:

Residual is another word for error.

To find the residual you take the actual data and SUBTRACT the predicted data.

A residual plot is another type of scatter plot that shows the relationship of the residual to the x value.

If the regression model is appropriate, then the RESIDUAL plot will have a random scatter.

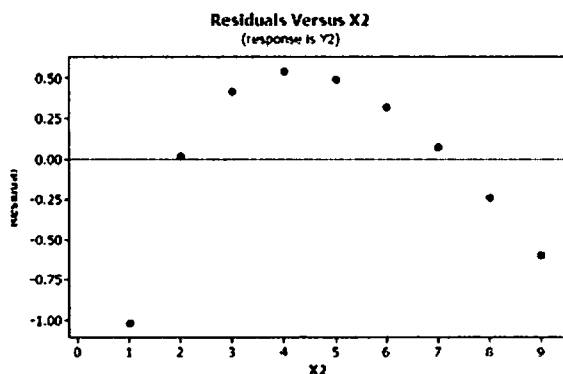
If the RESIDUAL plot creates a pattern then the regression model is not a good fit.

Pattern = Problem

EXAMPLES:

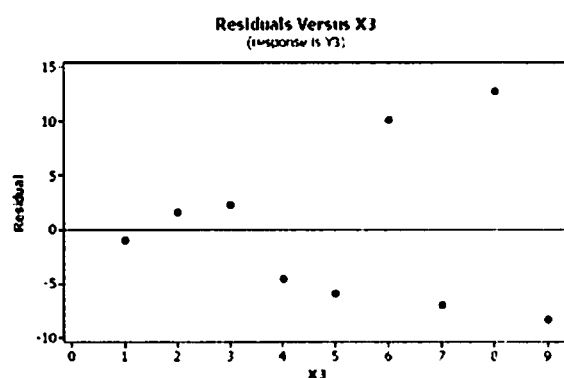
Determine if the linear regression model is appropriate by looking at the graph of the residuals.

1.



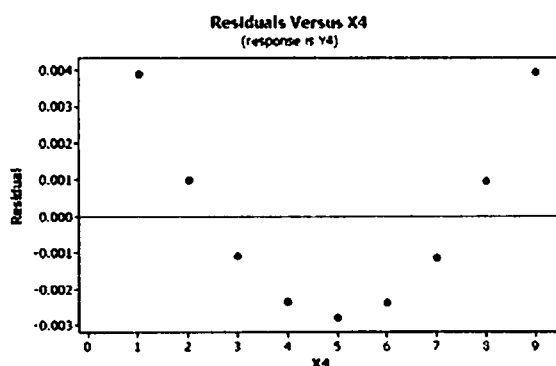
NO

2.



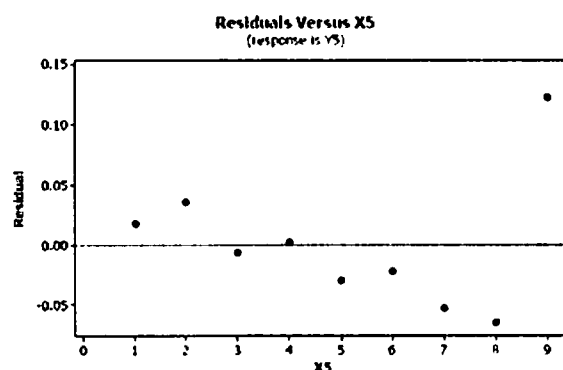
yes

3.



NO

4.



yes

GUIDED EXAMPLE:

Step 1: Find the linear regression model using your calculator.

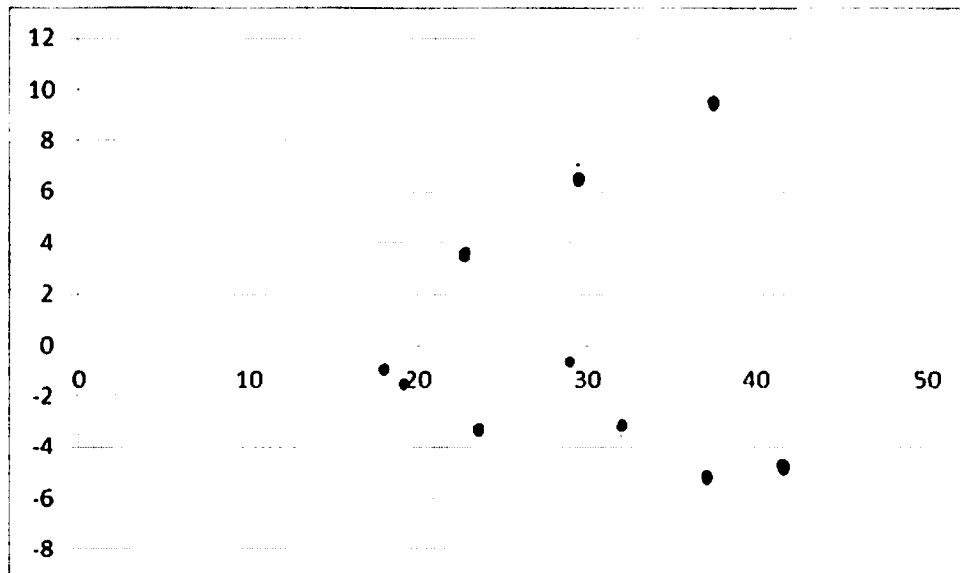
$$y = 1.73x - 0.96$$

Total Time (minutes)	Total Distance (miles)	Predicted Total Distance	Residuals (observed - predicted)
32	51	54.4	-3.4
19	30	31.91	-1.91
28	47	47.48	-0.48
36	56	61.32	-5.32
17	27	28.45	-1.45
23	35	38.83	-3.83
41	65	69.97	-4.97
22	41	37.1	3.9
37	73	63.05	9.95
28	54	47.48	6.52

Step 2: Use the regression model to find the predicted values. (3rd Column)

Step 3: 2nd Column - 3rd Column = 4th Column

Step 4: Graph the points (1st Column, 4th Column).



Graph is scattered so the model is a good fit.
