Name: ______________________________ Date: ______________________________

4.5 Analyzing Lines of Fit

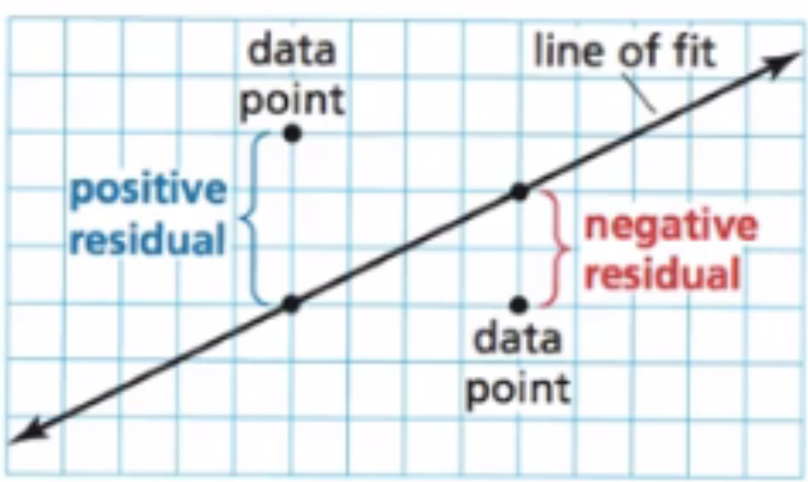
Essential Question: ____

____

One way to determine how well a line of fit ______________ a data set is to __________ residuals.

A ______________ is the _____________ of the y-value of a data point and the corresponding y-value found using the ________ of fit. A residual can be ______________, ________________ or ______.

A scatter plot of the residuals shows how well a model _______ a data set. If the model is a good is a good fit, then the ____________ values of the residuals are relatively small, and the residuals points will be more or less _________ dispersed about the _____________ axis. If the model is ______ a good fit, then the residuals points will form some type of ___________ that suggests the data is not __________. Wildly scattered residual points suggest that the data might have no __________________.



EXAMPLE 1 Using Residuals

In Example 3 in Section 4.4, the equation $y = -2x + 20$ models the data in the table shown. Is the model a good fit?

Week, x	Sales (millions), y
1	\$19
2	\$15
3	\$13
4	\$11
5	\$10
6	\$8
7	\$7
8	\$5

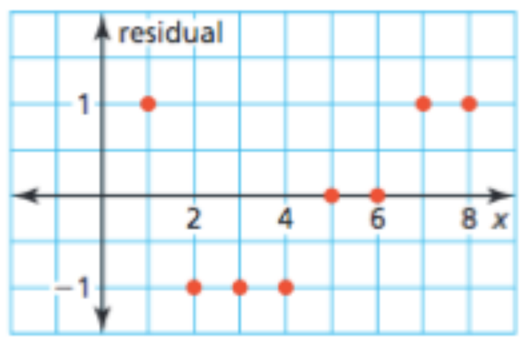
Step 1: ______________________________________

____

Step 2: ______________________________________

____

x	y	y-Value from model	Residual
1	19	18	$19 - 18 = 1$
2	15	16	$15 - 16 = -1$
3	13	14	$13 - 14 = -1$
4	11	12	$11 - 12 = -1$
5	10	10	$10 - 10 = 0$
6	8	8	$8 - 8 = 0$
7	7	6	$7 - 6 = 1$
8	5	4	$5 - 4 = 1$



EXAMPLE 2 **Using Residuals**

The table shows the ages x and salaries y (in thousands of dollars) of eight employees at a company. The equation $y = 0.2x + 38$ models the data. Is the model a good fit?

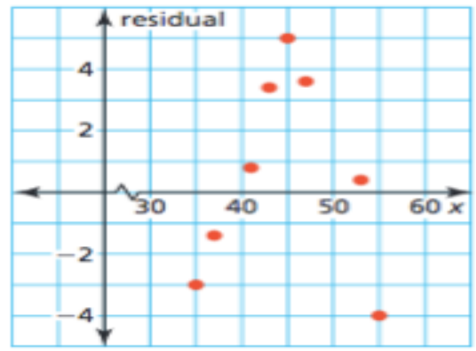
Age, x	35	37	41	43	45	47	53	55
Salary, y	42	44	47	50	52	51	49	45

SOLUTION

Step 1 Calculate the residuals. Organize your results in a table.

Step 2 Use the points (x, residual) to make a scatter plot.

x	y	y-Value from model	Residual
35	42	45.0	$42 - 45.0 = -3.0$
37	44	45.4	$44 - 45.4 = -1.4$
41	47	46.2	$47 - 46.2 = 0.8$
43	50	46.6	$50 - 46.6 = 3.4$
45	52	47.0	$52 - 47.0 = 5.0$
47	51	47.4	$51 - 47.4 = 3.6$
53	49	48.6	$49 - 48.6 = 0.4$
55	45	49.0	$45 - 49.0 = -4.0$



Finding Lines of Best Fit

Graphing calculators use a method called ____________ _______________to find a precise line of fit called the line of best fit. This line models a ______ of _______. A calculator often givens a value __, called the ______________ _____________. This value tells whether the correlation is _____________ or ________________ and how closely the _______________ models the data. Values of r ange from _____to ______. When r is _________ to 1 or -1, there is a _______________ correlation between the _________________. As r, gets closer to _____, the correlation becomes ____________.

Draw the scale that is shown in the video in the space below: