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HW: Residual Plot

created for you by Ms. Nhotsovbanh

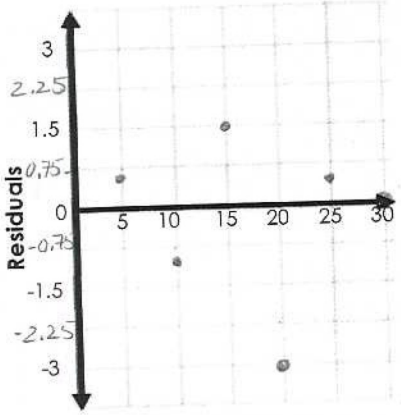
Complete each table using the given linear regression (Round answers to one decimal place). Construct a residual plot.

1. Linear regression equation: $y = 0.5x$

L1 L2

x	y (observed value)	Predicted Value	Residual Value
5	3	2.5	0.5
10	4	5	-1
15	9	7.5	1.5
20	7	10	-3
25	13	12.5	0.5
30	15	15	0

subtract



Does the residual plot suggest a linear relationship? Explain.

Yes, b/c the residual plot has a random pattern along the x-axis and it does not have a curve pattern

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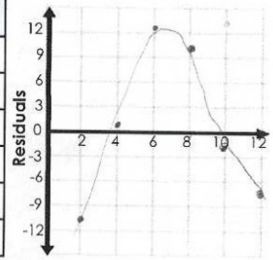
2. Linear regression equation: y = −0.4x + 16.3

x	y (Observed Value)	Predicted Value	Residual Value
2	5	15.5	−10.5
4	15	14.7	0.3
6	26	13.9	12.1
8	23	13.1	9.9
10	11	12.3	−1.3
12	3	11.5	−8.5

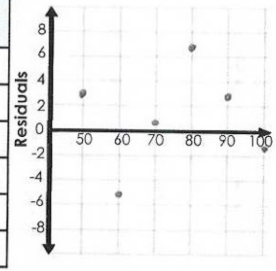


Does the residual plot suggest a linear relationship? Explain.

NO, b/c it has a curve pattern.

3. Linear regression equation: y = 4.9x + 16.4

x	y (Observed Value)	Predicted Value	Residual Value
100	505	506.4	−1.4
90	460	457.4	2.6
80	415	408.4	6.6
70	360	359.4	0.6
60	305	310.4	−5.4
50	265	261.4	3.6

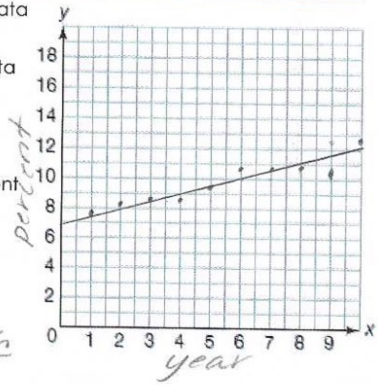


Would this regression line be a good predictor of the data? yes, b/c the residuals are randomly scattered closely to the x-axis

4. The table shows the percent of the United States population who did not receive needed dental care services due to cost.

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Percent	7.9	8.1	8.7	8.6	9.2	10.7	10.7	10.8	10.5	12.6	13.3

a. Sketch a scatter plot of the data



b. State the linear regression equation represented by the data table. Round all values to the nearest hundredth.

y = 0.51x + 7.03

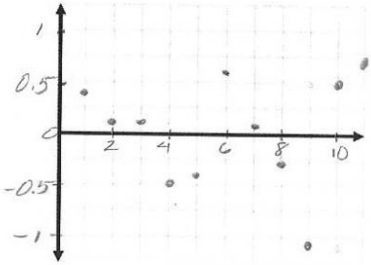
c. State the correlation coefficient to the nearest hundredth and determine whether the data suggest a strong or weak association.

r = 0.95 strong association b/c it is close to 1.

d. Calculate the residuals for the set of data (round to one decimal place). Then construct a residual plot for the data. Yr 1999 = 1

y = 0.51x + 7.03

x	y	Predicted Value	Residual Value
1	7.9	7.5	0.4
2	8.1	8.1	0.1
3	8.7	8.6	0.1
4	8.6	9.1	−0.5
5	9.2	9.6	−0.4
6	10.7	10.1	0.6
7	10.7	10.6	0.1
8	10.8	11.1	−0.3
9	10.5	11.6	−1.1
10	12.6	12.1	0.5
11	13.3	12.6	0.7



(x, residual)