

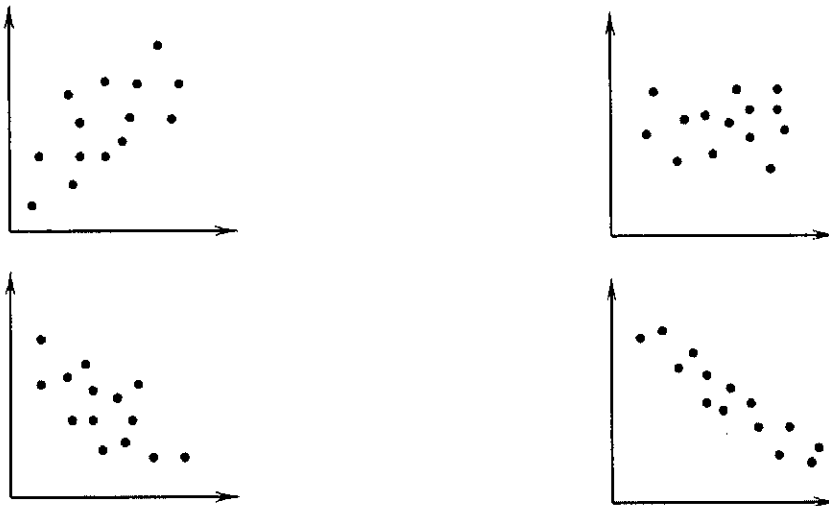
## Residuals and Correlation Coefficient

**Do Now:** A skydiver jumps from an airplane and attached microcomputer records the time and speed of the diver for the first twelve seconds of the diver's freefall. The data is shown in the table below.

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

Find the equation for the line of best fit. Round both coefficients to the nearest tenth.

Correlation Coefficient:



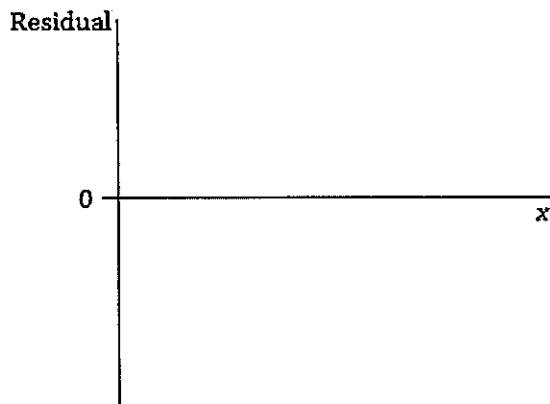
**Example 1:** Find the correlation coefficient from the Do Now. Determine how strong of a fit the line best fit is. Create a plot with the data and line of best fit on it.

Residuals:

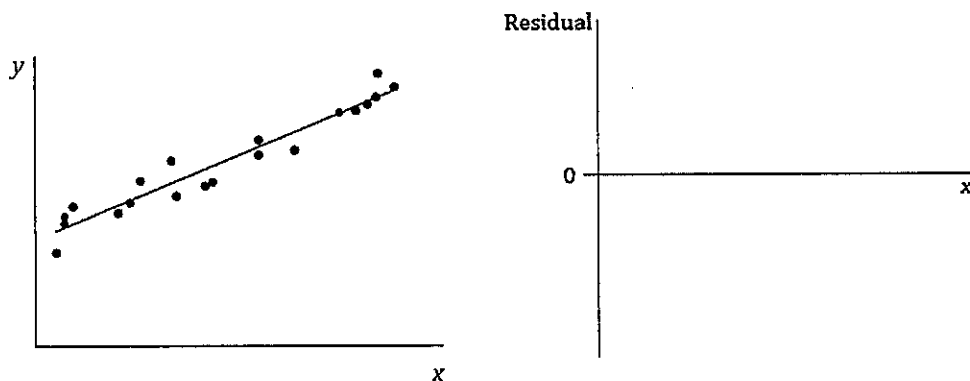
We do not want RESIDUALS to fall along a curve or make a distinct pattern. If so then the linear model is not appropriate to fit the data.

**Example 2:** Using the table on your calculator fill in the table below with the predicted values. Round to the nearest integer. Find the residuals for each data point. Graph the residuals below.

Time (s)	0	2	4	6	8	10	12
Speed	0	25	46	60	68	72	74
Prediction							
Residual							



**Example 3:** Based on the data shown to the left, sketch what the plot of the residuals would look like.



**Example 4:** Given the scatter plot shown, which of the  $r$ -values would most likely represent the correlation between the two variables? Explain.

- a)  $r = 0.88$
- b)  $r = 0.28$
- c)  $r = 1$
- d)  $r = -0.94$

