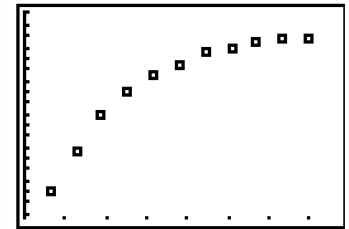
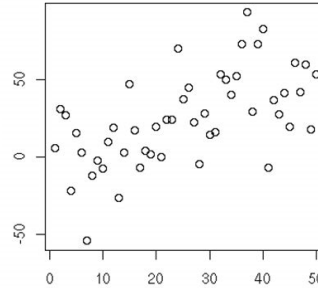
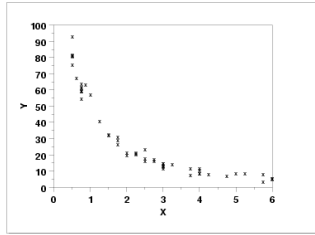
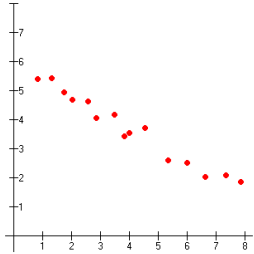


Part A: Fitting Linear Functions to Scatter Plots [S-ID.B.6c]

Answer the questions completely.

1. **Approximate** the correlation coefficient, r , for each of the scatter plots below. **Sketch** a line of best fit, if appropriate.



Part B: Fitting and Using Functions to Solve Problems [S-ID.B.6a]

Answer the questions completely.

2. The following data set shows the relationship between the average height of a breed of dog, measured in inches, and top running speed, measured in miles per hour.

Height	12	8	24	26	40	38	14	17	20	20
Speed	15	12	24	28	32	37	13	20	19	16

You may use technology (ex. Graphing Calculator or DESMOS) to assist in answering this question. Transcribe your findings to answer the questions below.

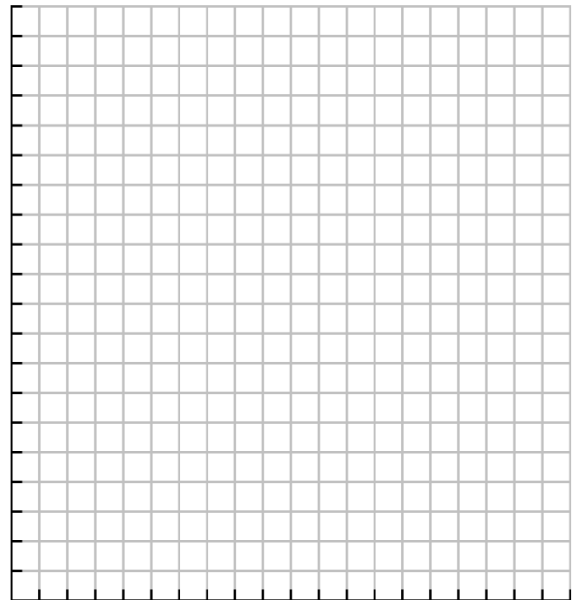
A) **Label** and **scale** the axes provided to the right appropriately, such that the data above can be accurately plotted on the graph.

B) **Plot** the points from the data set above onto the graph.

C) **Draw** the line of best fit accurately on the graph.

D) **Write** the equation of the line of best fit.

E) **Predict**, using the equation of the line of best fit, the top speed of a breed of dog with average height of 32 inches.

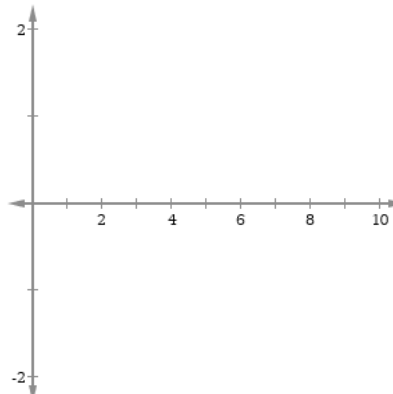


Answer the questions completely.

3. You are conducting an experiment and gather data on cherry tree age, measured in years, versus tree height, measured in feet. You find the regression equation to be $f(x) = 1.077x + 10.12$.

A) Fill out the table below, using the regression equation to predict tree heights. Calculate the residuals. B) Plot the residuals on the residual plot.

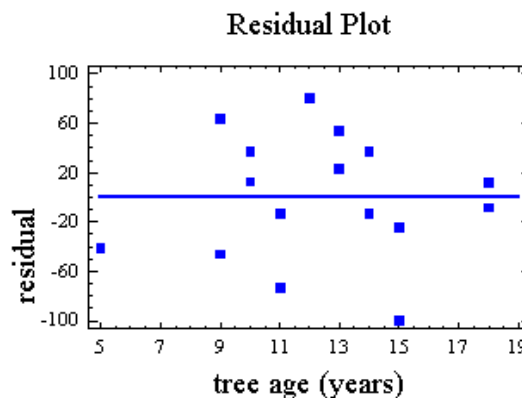
x	y	$f(x) = 1.077x + 10.12$ Prediction from Equation:	Residual
2	12		
4	16		
5	14		
9	20		



4. A second study on tree heights was conducted. The residual plot to the right shows the residual values for each x value (age of the tree in years) with the corresponding y value (height of the tree in feet).

A) Circle the tree for which the height varies the most from the predicted value generated by the regression equation. Justify your answer.

B) Suppose the regression equation for this second study was found to be $y = 7.5x + 26$. Determine the height of the tree that is 5 years old.



Part D: Understanding Correlation and Causation [S-ID.B.6]

Answer the questions completely.

5. For each situation, explain how the two variables can have such strong correlation, but not causation.

