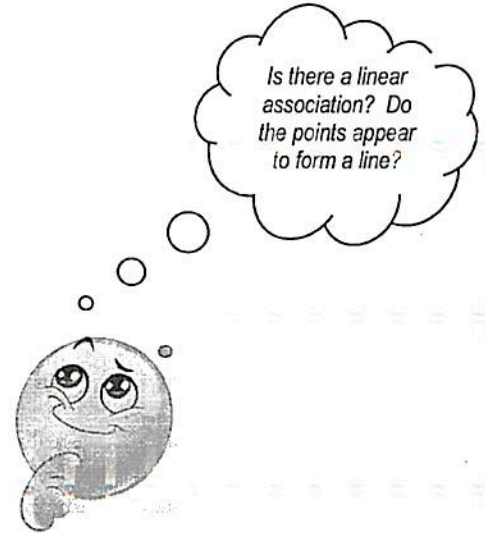
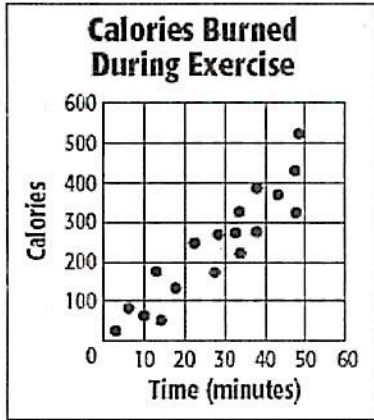


## Algebra RH

**Essential Question:** How can we represent a data set with a linear model?

**Do Now:** Does the graph show a positive correlation, negative correlation, or no correlation?  
If there is a positive or negative correlation, describe its meaning in the situation.



## Line of Fit

When a **bivariate data** set displays a *strong positive or negative correlation*, you can use a linear equation to represent the data. The process is called finding a **line of fit** for the data. This line is referred to as a **trend line** or **linear regression model**.

## Drawing a Line of Fit for Data

Draw a line that passes as close as possible to the plotted points.

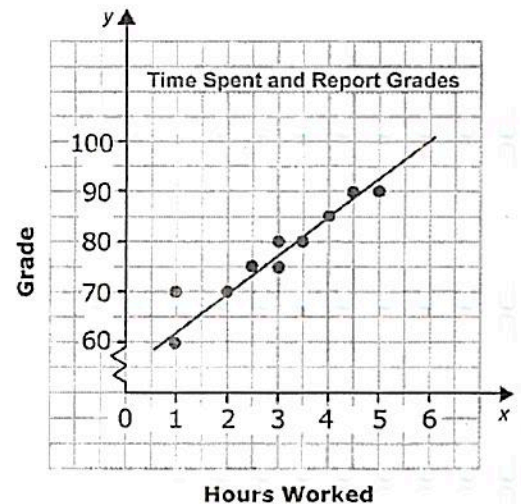
- Your line does not necessarily have to pass through any of the plotted points.
- You should try to have about the same number of points above and below the line.

## Finding the Equation of the Line of Fit

Choose two points on the line of best fit. \_\_\_\_\_

Find the slope

Find the y-intercept

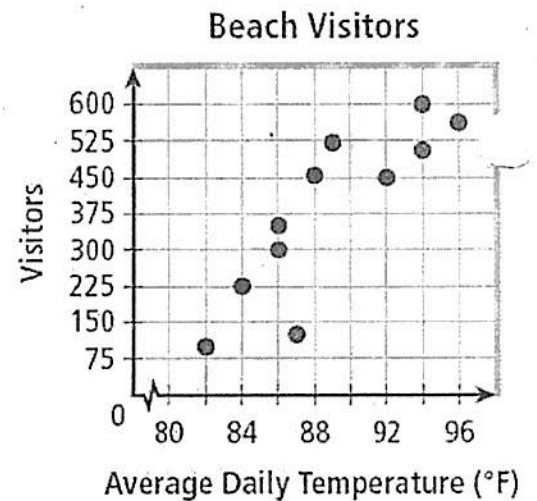


Equation of Best Fit Line \_\_\_\_\_

### Let's Try Another!

- Draw a line of best fit.
- Choose two points on the line. \_\_\_\_\_
- Find slope and the y-intercept.

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- Write the equation of the line of fit. \_\_\_\_\_

### Using the Line of Fit to Make Predictions

When you use a trend line or its equation to predict a value within the data points, you **interpolate** the predicted value.

When you make a prediction that is *outside* the data, you **extrapolate** the predicted value.

Using the equation of the line of fit for the beach visitors,

(a) Predict the number of beach visitors if the temperature is 90° (interpolation).

(b) Predict the number of beach visitors if the temperature is 102° (extrapolation).

There are two types of data: univariate and bivariate data.

Univariate Data	Bivariate Data
involving a single variable	involving two variables
does not deal with causes or relationships	deals with causes or relationships
the major purpose of univariate analysis is to describe	the major purpose of bivariate analysis is to explain
central tendency - mean, mode, median dispersion - range, variance, max, min, quartiles, standard deviation. frequency distributions bar graph, histogram, pie chart, line graph, box-and-whisker plot	analysis of two variables simultaneously correlations comparisons, relationships, causes, explanations tables where one variable is contingent on the values of the other variable. independent and dependent variables
Sample question: How many of the students in the freshman class are female?	Sample question: Is there a relationship between the number of females in Computer Programming and their scores in Mathematics?

4. Determine if the problem deals with univariate or bivariate data.
  - A. Determine if the number of hours a student studies will improve his/her final examination scores.
  - B. Determine the mean score on the last math test.
  - C. Determine whether lowering cholesterol lowers the risk of heart disease.
  - D. Prepare a frequency table for the number of students scoring A, B, C and D on the Chemistry test.
  
5. Which situation should be analyzed using bivariate data?
  - A. Ms. Fonseca keeps a list of the amount of time her daughter spends on her social studies homework.
  - B. Mrs. Huntley tries to see if her students' shoe sizes are directly related to their heights.
  - C. Mr. Chang records his customers' best video game scores during the summer.
  - D. Mrs. Gizzi keeps track of her daughter's algebra grades for the quarter.
  
6. Which is an example of univariate data?
  - A. measuring the heart rate of different people at different ages
  - B. measuring heart rates with different numbers of hours of sleep
  - C. measuring heart rates with different numbers of hours of exercise per week
  - D. measuring heart rates of ten 14 year old girls

A \_\_\_\_\_ can help us summarize a set of data. The line and its equation can help us make predictions about the relationship between the two variables. When you use the trend line or its equation to predict a value within the set of data, you are \_\_\_\_\_. When you make a prediction outside the set of data, you are \_\_\_\_\_.

Algebra RH

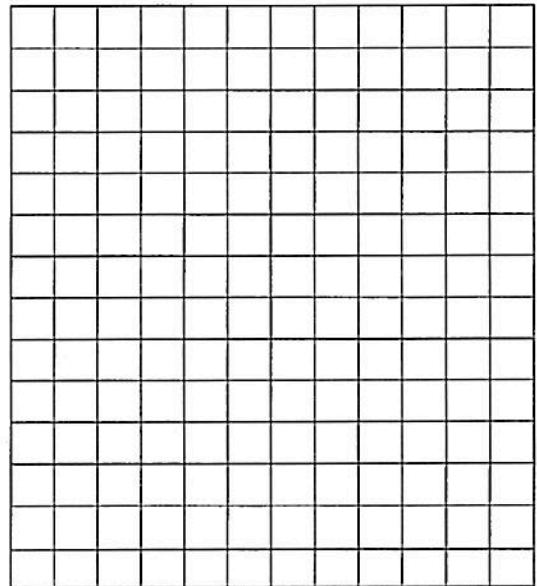
HW # \_\_\_\_\_



Joyce is training for a 10K race. For some of her training runs, she records the distance she ran and how many minutes it took her.

(a) Make a scatter plot of Joyce's running data.

Distance (mi)	Time (min)
4	38
2	25
1	7
2	16
3	26
5	55
2	20
4	45
3	31



(b) Describe the correlation.

(c) Draw a trend line and write the equation of the line.