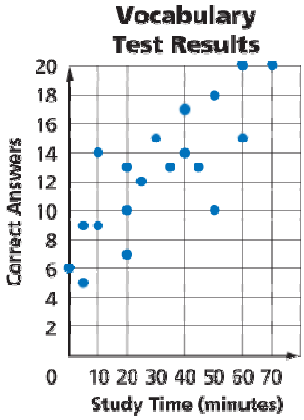
Lesson 1-4

Example 1

Use the scatter plot.



a. How many correct answers did the student who studied for 30 minutes have?

b. Find the mode of the minutes spent studying for the vocabulary test.

c. Find the range of the correct answers on the test.

d. Find the median of the correct answers on the test.

Solution

a. Locate 30 on the horizontal axis. Find the corresponding number of correct answers for this point. This student had 15 correct answers on the test.

b. Find the study time with the greatest number of points above it. The mode of the times spent studying is 20 minutes.

c. The highest score on the test is 20 correct answers, and the lowest score is 5 correct answers. So the range is $20 - 5 = 15$ correct answers.

d. There are 19 data points on the plot. Count to the tenth point on the graph starting with the lowest number of correct answers. The median of the correct answers is 13.

Example 2

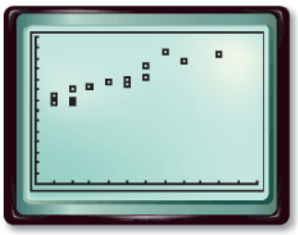
HEALTH Mrs. Clements had her students measure their heart rates, in beats per minute, after running different numbers of laps around the gym. The results are shown in the table below.

Use a graphing utility to display a scatter plot of the data.

Laps	Heart Rate		Laps	Heart Rate
2	90		7	126
5	99		5	95
1	83		2	77
3	92		6	102
6	114		1	77
2	80		10	124
8	118		4	96

Solution

Enter the laps data into a list, L1, and the heart rate that corresponds to each number of laps into another list, L2. Turn on Plot 1. Select scatter plot as the type of plot to display. Set the viewing window as follows.



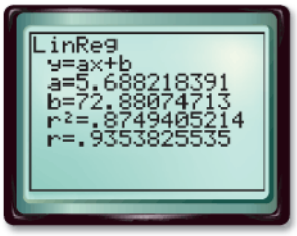
x min = 0 x max = 12 x scale = 1
y min = 0 y max = 140 y scale = 10

Example 3

Graph a line of best fit for the scatter plot in Example 2.

Solution

The line of best fit is called linear regression on most graphing utilities. You can display the linear regression on the home screen by choosing it under the Calculate menu of the Statistics menu.



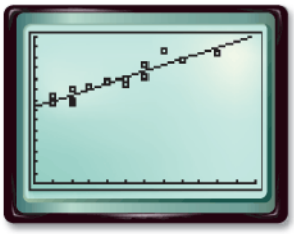
To graph the line and the scatter plot, enter the linear regression equation. Be sure that equation and Plot 1 are turned on (just as you set for Example 2).

Follow the sequence of calculator screens to graph the scatter plot and line of best fit simultaneously.

Equation screen

Select regression equation from the Statistical Equations in the Variables menu.

Equation screen after linear regression equation in place



A graph of the scatter plot and line of best fit

Example 4

Use Examples 2 and 3 to answer the following.

a. Predict the heart rate of a student after running 9 laps around the gym.

b. Name the type of correlation between the number of laps run and heart rate. Explain.

c. Which point lies farthest from the trend line? What could account for this?

Solution

a. Locate 9 laps on the horizontal axis. Move up to the line of best fit, then over to the vertical axis. The heart rate is about 124 beats per minute.

b. The trend line slopes upward to the right, so there is a positive correlation. As a student runs more laps around the gym, the heart rate increases.

c. The point farthest from the trend line represents a student who has run 7 laps and has a heart rate of 126 beats per minute. This might represent a student who is not in the greatest physical condition.