Chapter 6 Section 1
Statistical Measure

To find the mean and median

The average score in the math portion of the SAT was 432. The EPA estimates that a 1997 Eagle Talon averages 28 miles per gallon on the highway. The average rainfall for portions of Kauai is 350 inches per year. Each of these statements uses one number to describe an entire collection of numbers. Such a number is called average.

In statistics there are various ways to calculate an average. Two of the most common, mean and median, are discussed here.

An automotive engineer tests the mile-per-gallon ratings of 15 cars and records the results as follows.

Miles per Gallon Ratings of 15 cars
25 22 21 27 25 35 29 31 25 26 21 39 34 32 28

The **mean** of the data is the sum of the measurements divided by the number of measurements. The symbol for the mean is   .

Formula for the Mean

= sum of the data values / number of data values

To find the mean for the data above, add the numbers and then divide by 15.

= (25 + 22 + 21 + 27 + 35 + 29 + 31 + 25 + 26 + 21 + 39 + 34 + 32 + 28) / 15

= 420 / 15 = 28

The mean number of miles per gallon for the 15 cars tested was 28 miles per gallon.

The mean is one of the most per frequently computed averages. It is the one that is commonly used to calculate a student s performance in a class.

> The test scores for a student taking American history were 78, 82, 91, 87, and 93. What was the mean score for this student?

> To find the mean, add the test score. Then Divide by 5, the number of scores.

> = (78 + 82 + 91 + 87 + 93) / 5

> = 431 / 5 = 86.2

The mean score for the history student was 86.2.

The **median** of data is the number that separates the data into two equal parts when the numbers are arranged from smallest to largest (or largest to smallest). There are an equal number of values above the median and below the median.

To find the median of a set of numbers, first arrange the numbers from smallest to largest. The median is the number in the middle. The result of arranging the miles-per-gallon ratings given on the previous page from smallest to largest is shown.

21 21 22 25 25 25 26   27   28 29 31 32 34 35 39
7 values below the median   Middle number   7 values above the median
                                 median

The median is 27.

If the data contain an even number of values, the median is the mean of the two middle numbers.

The selling price of the last six homes sold by a real estate agent were $175,000, $150,000, $250,000, $130,000, $245,000, and $190,000. Find the median selling price of these homes.

Arrange the numbers   130,000 150,000 175,000 190,000 245,000 250,000
from the smallest to   Middle 2 numbers
largest. Because there
is an even number of   Median = 175,000 + 190,000 / 2 = 182,500
values, the median is
the mean of the two   The median selling price was $182, 5000
middle numbers.

Example 1

Twenty students were asked the number of units in which they were enrolled. The reponses were:

15, 12, 13, 15, 17, 18, 13, 20, 9, 16, 14, 10, 15, 12, 17, 16, 6, 14, 15, 12

Find the mean number of units taken by these students.

Strategy
To find the mean number of units:

   Determine the sum of the numbers.
   Divide the sum by 20.

Solution   The sum of the number is 279.
x = 279 / 20 = 13.95
The solution is 13.95 units.