



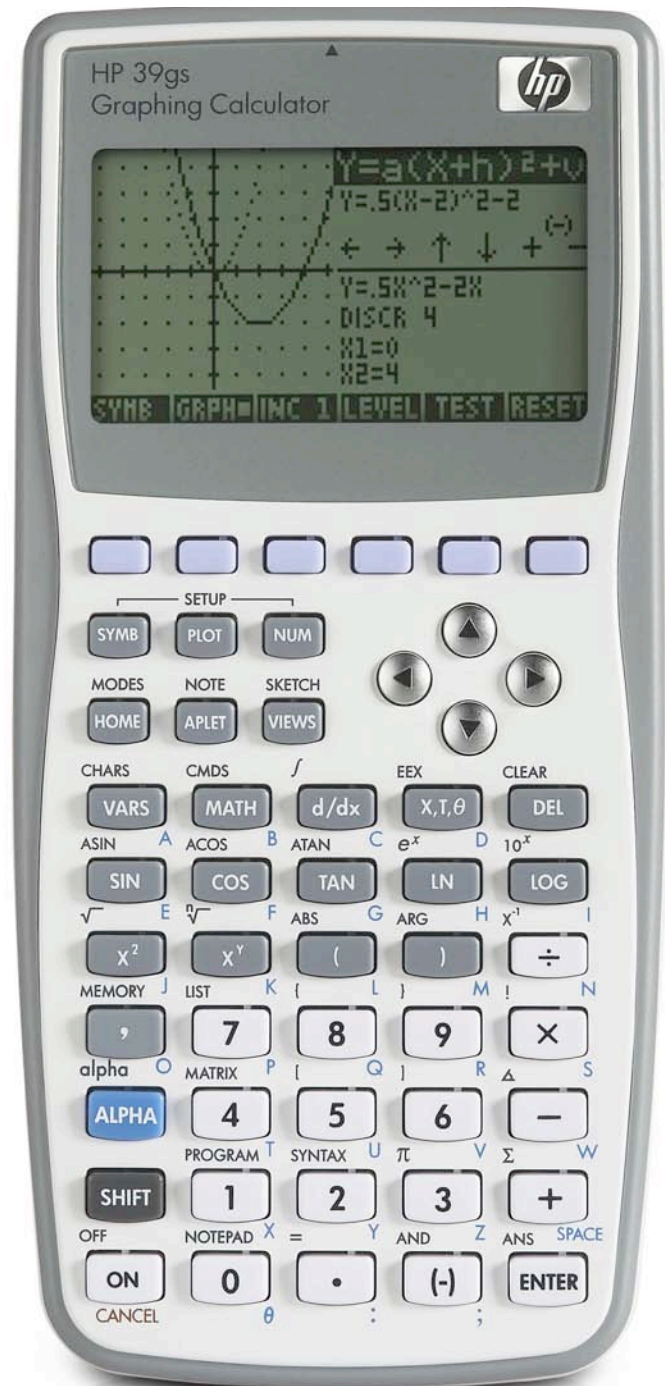
## hp calculators

HP 39gs Average sales prices

The Statistics aplet

Averages and Standard Deviations

Practice finding average sale prices and standard deviations



### The Statistics applet

The HP 39gs contains a statistics applet to calculate a wide variety of statistical measures from input data. To access this applet, press **APLET**. Scroll down the list using the **▼** key until "Statistics" is highlighted in the display as shown below.



Figure 1

Press **STAT** to begin the applet. A data entry form is then displayed that is used to solve a number of statistics problems.

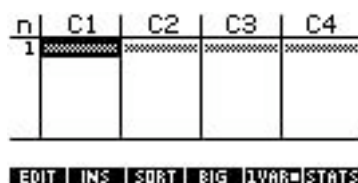


Figure 2

The form displays columns where data may be entered for analysis. Key in data and press **ENTER**. The cursor will drop down to the next row. Continue entering data this way until all data is entered.

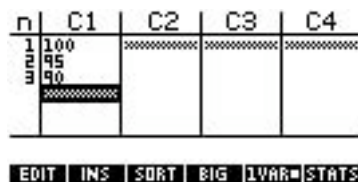


Figure 3

Press **3/4** to increase the size of the displayed data, as shown below.

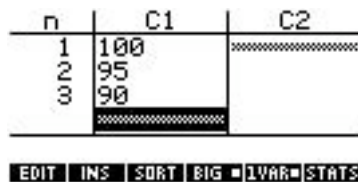


Figure 4

Press **STAT** to display a screen with summary statistics listed, as shown below.

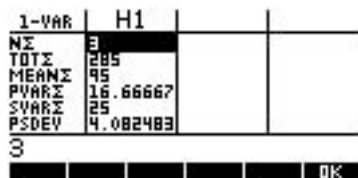


Figure 5

Press **▲** or **▼** to scroll down through additional calculations performed on the data entered, as shown below.

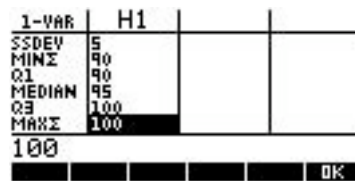


Figure 6

### Averages and standard deviations

The average is defined as the sum of all data points divided by the number of data points included. It is a measure of central tendency and is the most commonly used. A standard deviation is a measure of dispersion around a central value. To compute the standard deviation, the sum of the squared differences between each individual data point and the average of all the data points is taken and then divided by the number of data points included (or, in the case of sample data, the number of data points included minus one). The square root of this value is then taken to obtain the standard deviation. The property of the standard deviation is such that when the underlying data is normally distributed, approximately 68% of all values will lie within one standard deviation on either side of the mean and approximately 95% of all values will lie within two standard deviations on either side of the mean. This has application to many fields, particularly when trying to decide if an observed value is unusual by being significantly different from the mean.

### Practice finding average sale prices and standard deviations

**Example 1:** The sales price of the last 10 homes sold in the Parkdale community were: \$198,000; \$185,000; \$205,200; \$225,300; \$206,700; \$201,850; \$200,000; \$189,000; \$192,100; \$200,400. What is the average of these sales prices and what is the sample standard deviation? Would a sales price of \$240,000 be considered unusual in the same community?

**Solution:** Be sure to clear out any rows already containing values before entering the data.

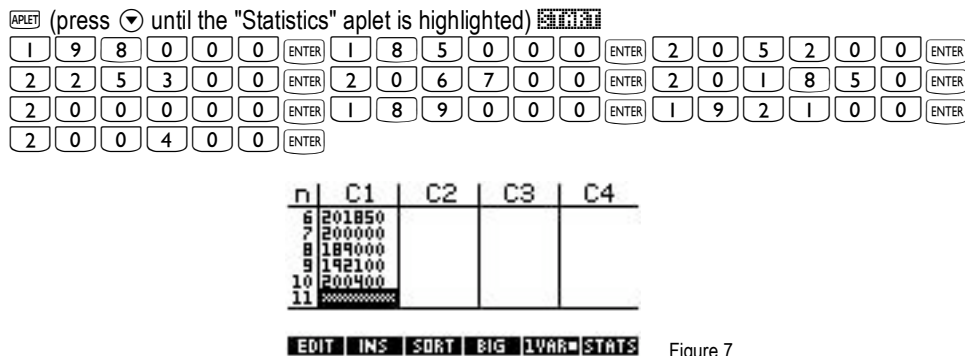


Figure 7



Figure 8

▼ ▼ (This is the average)

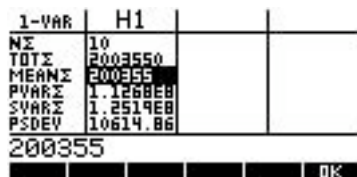


Figure 9

⏮ ⏮ ⏮ ⏮

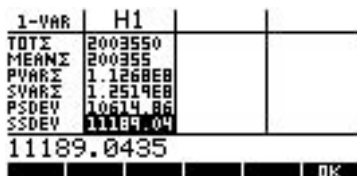


Figure 10

**Answer:** The average sales price is \$200,355 and the sample standard deviation is \$11,189. Within two standard deviations on either side of this average, in this case between \$177,977 and \$222,733, 95% of all home sales prices should fall. If a home were to sell for \$240,000 in this area, it would be an unusual event.

**Example 2:** The sales price of the last 7 homes sold in the real estate office's zip code were: \$245,000; \$265,000; \$187,000; \$188,000; \$203,000; \$241,900; \$222,000. What is the average of these sales prices and what is the sample standard deviation?

**Solution:** **APLET** (press ⏮ until the "Statistics" aplet is highlighted) **STAT**  
 Be sure to clear out any rows already containing values before entering the data by pressing **SHIFT** **CLEAR** ⏮  
 (Choose to clear column C1 only or All Columns)  
 2 4 5 0 0 0 ENTER 2 6 5 0 0 0 ENTER 1 8 7 0 0 0 ENTER  
 1 8 8 0 0 0 ENTER 2 0 3 0 0 0 ENTER 2 4 1 9 0 0 ENTER  
 2 2 2 0 0 0 ENTER

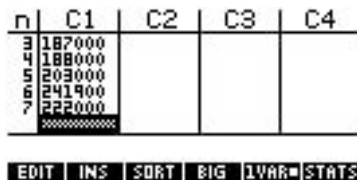


Figure 11

**STAT**

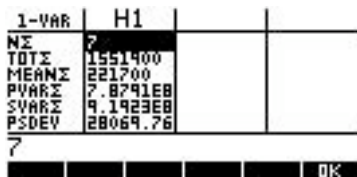


Figure 12

⏮ ⏮ (This is the average)

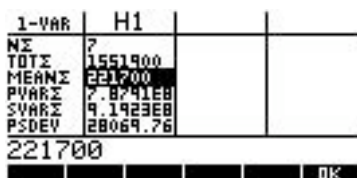


Figure 13

## hp calculators

### HP 39gs Average sales prices

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1-VAR	H1		
TOTΣ	1551900		
MEANΣ	221700		
PVARΣ	7.8791E8		
SVARΣ	4.1923E8		
PSDEV	28069.75		
SSDEV	30318.81		
30318.8060451			
OK			

Figure 14

Answer: The average sales price is \$221,700 and the sample standard deviation is \$30,318.81.