

## Lesson 12–6

### Example 1 Choose a Measure of Central Tendency

**SHOPPING** Matt wants his parents to give him money to buy a new snowboard so he researched the cost of 20 different snowboards at various stores. The table shows the prices he found.

\$429.99	\$399.50	\$99.99	\$224.75	\$75.99	\$209.25	\$228.19	\$439.88	\$435.75	\$199.50
\$409.20	\$415.99	\$229.98	\$360.15	\$429.99	\$199.99	\$365.75	\$450.19	\$205.25	\$429.99

- a. Find the mean, median, and mode of the data. Which measure of central tendency best represents the prices?

Use a calculator to add the data and divide by the number of items. The mean is about \$311.96. Order the data from least to greatest and find the middle number. The median is \$362.95. Find the price that occurs most often. The mode is \$429.99.

Since there are two prices, \$75.99 and \$99.99, that are quite low in comparison to the other prices, the median, \$362.95, is probably the best representation for the prices.

- b. Which measure of central tendency would Matt probably like to report to his parents? Explain your reasoning.

He would probably want to tell them the mode since it is the highest. Then they may give him more money to spend on the snowboard.

### Example 2 Standard Deviation

**STATES** The table shows the population density, rounded to the nearest whole number, for ten western states as of the 2000 census. The density is given in people per square mile. Find the standard deviation for the data.

State	People/square mile		State	People/square mile
Arizona	45		Nevada	18
California	217		Oregon	36
Colorado	41		Utah	27
Idaho	16		Washington	89
Montana	6		Wyoming	5

Source: World Almanac

- Step 1** Find the mean. Add the data and divide by the number of items.

$$\begin{aligned}\bar{x} &= \frac{45 + 217 + 41 + 16 + 6 + 18 + 36 + 27 + 89 + 5}{10} \\ &= 50\end{aligned}$$

The mean of the data is 50

- Step 2** Find the standard deviation.

$$SD = \sqrt{\frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \dots + (x_n - \bar{x})^2}{n}}$$

Standard deviation formula

$$\begin{aligned} &= \sqrt{\frac{(45 - 50)^2 + (217 - 50)^2 + \dots + (89 - 50)^2 + (5 - 50)^2}{10}} \\ &= \sqrt{\frac{36,382}{10}} \\ &\approx 60.3 \end{aligned}$$

Simplify.

Use a calculator.

The standard deviation is about 60.3.