

## 2.4 Calculating the Correlation (Part 1)

In Lesson 2.3, you learned that the correlation  $r$  measures the strength and direction of the linear relationship between two quantitative variables. In this lesson, you will learn how to calculate the correlation and explore its properties.

### How to Calculate the Correlation $r$

1. Find the mean and the standard deviation of the explanatory variable. Calculate the z-score for the value of the explanatory variable for each individual.
2. Find the mean and standard deviation of the response variable. Calculate the z-score for the value of the response variable for each individual.
3. For each individual, multiply the z-score for the explanatory and response variables.
4. Add the z-score products and divide the sum by  $(n - 1)$ .

**Example:** The table shows the foot length (in centimeters) and the height (in centimeters) for a random sample of six high school seniors. Calculate the correlation for these data.

Foot length (cm)	Height (cm)	Foot length (cm)	Height (cm)
23	167	28	163
32	188	28	185
22	150	23	155

$$r = 0.841$$