

Answer on Question #41035, Math, Statistics

Heights of men on a baseball team have a bell shaped distribution with a mean of 179 and a standard deviation of 7 cm. Using the empirical rule, what is the approximate percentage of men between the following values.

A. 172 cm and 186 cm

B 158 cm and 200 cm

Solution

A mean is $\mu = 179$ and a standard deviation is $\sigma = 7$.

A. What percentage of the men is between 172 cm and 186 cm?

The key to solving this problem is to recognize that 172 and 186 are each exactly 1 standard deviation away from the mean of 179. Therefore, 1 standard deviation from the mean is

$$179 - 7 = 172,$$

$$179 + 7 = 186.$$

The empirical rule tells us that about 68% of all values are within 1 standard deviation of the mean, so about 68% of men are between 172 cm and 186 cm.

B. What percentage of the men is between 158 cm and 200 cm?

The key to solving this problem is to recognize that 158 and 200 are each exactly 3 standard deviations away from the mean of 179. Therefore, 3 standard deviations from the mean is

$$179 - 3 \cdot 7 = 158,$$

$$179 + 3 \cdot 7 = 200.$$

The empirical rule tells us that about 99.7% of all values are within 3 standard deviations of the mean, so about 99.7% of men are between 158 cm and 200 cm.