Okay, let's tackle this problem with the precision expected of a graduate-level statistics student.

\*\*Understanding the Problem\*\*

We are given a normally distributed variable (height of American women) and asked to find the z-score for a specific data point (a woman who is six feet tall). The z-score, in this context, represents how many standard deviations away from the mean our data point lies. A positive z-score indicates the data point is above the mean, and a negative z-score indicates it's below the mean.

\*\*Key Formula\*\*

The formula for calculating the z-score is:

z = (x - μ) / σ

where:

\* z = z-score

\* x = the data point (in our case, the height of the woman)

\* μ = the population mean (65.5 inches)

\* σ = the population standard deviation (2.5 inches)

\*\*Calculations\*\*

1. \*\*Convert Units:\*\* We need to ensure all units are consistent. The problem gives the mean and standard deviation in inches. Since the woman's height is given as six feet, we first convert it to inches.

6 feet \* 12 inches/foot = 72 inches. So, x = 72 inches.

2. \*\*Apply the Formula:\*\* Now we plug the values into the z-score formula:

z = (72 inches - 65.5 inches) / 2.5 inches

z = 6.5 / 2.5

z = 2.6

\*\*Answer\*\*

The z-score for a woman six feet tall is 2.6. Therefore, the correct answer is \*\*(A) 2.6\*\*.

\*\*Interpretation\*\*

A z-score of 2.6 indicates that a woman who is six feet tall is 2.6 standard deviations \*above\* the average height for women in this age group. This also tells us that a six foot woman is relatively tall compared to the average.