

Answer on Question #63865 – Math – Statistics and Probability

Question

A group of students has measured the heights of 90 trees. The class calculate the mean height to be $\bar{x} = 12.4$ m with standard deviation $s = 5.35$ m. One student notices that two of the measurements, 44.5 m and 43.2 m, are much too big and must be wrong.

(a) How many standard deviations away from the mean of 12.4 is the value 44.5?
(3marks)

The incorrect measurements of 44.5 m and 43.2 m must be removed from the data.

(b) Calculate the new value of \bar{x} after removing the two unwanted values.

Solution

(a) To define how many standard deviations the value 44.5 is away from the mean of 12.4, we shall calculate the following:

$$z = \frac{44.5 - 12.4}{5.35} = 6.$$

(b) The new mean height after removing the two unwanted values:

$$\bar{x}' = \frac{\bar{x}n - 44.5 - 43.2}{n - 2} = \frac{12.4 \cdot 90 - 44.5 - 43.2}{90 - 2} = 11.7 \text{ m.}$$

Answer: (a) 6; **(b)** 11.7 m.