Answer on Question #67339 – Math – Statistics and Probability

Question

A random sample of 50 perceived age estimates for a model in a cigarette advertisement showed that Picture = 26.72 years and that s = 3.7323 years.

(a)
Use this sample to calculate a 95 percent confidence interval for the population mean age estimate for all viewers of the ad. (Round your answers to 3 decimal places.)

The 95 percent confidence interval is
[,].

(b)
Remembering that the cigarette industry requires that models must appear at least 25 years old, does the confidence interval make us 95 percent confident that the population mean perceived age estimate is at least 25? Is the mean perceived age estimate much more than 25?

Solution.

(a) $95\% \ CI = \left(\bar{x} - t_{0.025,n-1} \frac{s}{\sqrt{n}}, \ \bar{x} + t_{0.025,n-1} \frac{s}{\sqrt{n}} \right) =$

$= \left(26.72 - 2.01 \frac{3.7323}{\sqrt{50}}, \ 26.72 - 2.01 \frac{3.7323}{\sqrt{50}} \right) =$

$= (26.72 - 1.061, \ 26.72 + 1.061) = (25.659, \ 27.781).$

(b) Since 25 does not lie in the confidence interval we are 95 percent confident that the population mean perceived age estimate is at least 25.
The mean perceived age estimate is 1.72 years more than 25.