

Homework Solutions

Chapter 10 – Page 647

Exercise 30

- (a) The value of t from the t -table is 2.093. Using 1-Var-Stats, we find that $\bar{x} = 164.85$ and $s = 53.576$. The confidence interval is

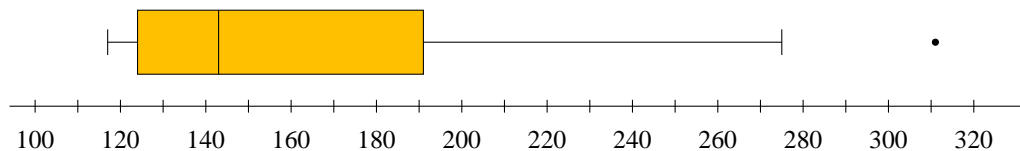
$$\begin{aligned}\bar{x} \pm z \left(\frac{s}{\sqrt{n}} \right) &= 164.851 \pm 2.093 \left(\frac{53.576}{\sqrt{20}} \right) \\ &= 164.85 \pm 25.074.\end{aligned}$$

If you use the TI-83 function `TInterval`, then your answer is (139.78, 189.92).

- (b) Can't tell, because we do not know what the population mean is.
- (c) Yes, it lies in the center of the interval.
- (d) Wider. That is because we have less information, leading to greater uncertainty. So the only way to maintain the 95% level of confidence is to include more values in the interval. Of course, this happens automatically when you apply the confidence interval formula.
- (e) (i) The five-number summary is

$$\begin{aligned}\text{Minimum} &= 117 \\ Q_1 &= 124.5 \\ \text{Median} &= 143 \\ Q_3 &= 191 \\ \text{Maximum} &= 311\end{aligned}$$

The IQR is $Q_3 - Q_1 = 191 - 124.5 = 66.5$, so the lower fence is $Q_1 - 1.5 \times \text{IQR} = 24.75$ and the upper fence is $Q_3 + 1.5 \times \text{IQR} = 290.75$. We see that 311 is an outlier and that the largest value below the upper fence is 275. Here is the modified boxplot.



- (ii) No, the assumption does not appear to be justified because the display shows that the sample is strongly skewed to the right.