

# Confidence Intervals

---

## 7.5 Small-Sample Confidence Intervals for a Population Mean

1. I randomly sampled nine Statistics textbooks published over the last two years. The average price for those books was \$154.27, and the standard deviation was \$21.78. Use the data collected and a 98% confidence interval to create a confidence interval for the true population average price of Elementary Statistics textbooks.
2. I counted the number of homework exercises provided (with solutions) in each of ten randomly selected sections of the textbook used for Statistics II at FIU. The average number of problems was 9.1, and the standard deviation was 1.7. Form a 90% confidence interval for the true average number of exercises (with solutions) per section of the textbook used for Statistics II at FIU.
3. The *Journal of Family Issues* reported on a study of marital happiness. The happiness scores ranged from 1 (not too happy) to 3 (very happy). A random selection of 28 of the married, heterosexual participants reported an average happiness score of 2.40 with a standard deviation of 0.588. Use a 95% confidence interval to estimate the true average happiness score for married heterosexual individuals (note: the average for single heterosexuals was 2.12 with a SD of 0.640).

Answers:

1.  $t_{\alpha/2} = 2.896, E = 2.896 \frac{21.78}{\sqrt{9}} = 21.02496$ , We are 98% confident the true mean price is between \$133.25 and \$175.29.
2.  $t_{\alpha/2} = 1.833, E = 1.833 \frac{1.7}{\sqrt{10}} = 0.985397$ , We are 90% confident the true mean number of problems per section is between 8.1 and 10.1.
3.  $t_{\alpha/2} = 2.052, E = 2.052 \frac{0.588}{\sqrt{28}} = 0.228021$ , We are 95% confident the true mean price is between 2.17 and 2.63.