

Homework 9

Due Monday, November 2

WMMY: Ch 8 # 1, 21*, 23*, 25*, 26*, 27*, 35*, 46, 47, 49

* For these problems, also sketch the sampling distribution and shade or mark the relevant areas or points.

Ch 9 # 1**, 7, 9, 11, 13, 15

** Hint: Use Example 9.1 and notice $S'^2 = \frac{n-1}{n} S^2$

- Problem A: For each of the bold numbers, decide if it is a parameter or a statistic.
- A random sample of female college students has a mean height of **65** inches, which is greater than the **64** inch mean height of all young women.
 - The manganese-sulfur ratio of hull steel recovered from the Titanic was found to be **6.8**, low by present standards. Modern steels have a ratio as high as **200**.
 - In an experiment, subjects pushed a button as quickly as they could after taking a caffeine pill and also after taking a placebo pill. The mean pushes per minute were **283** for the placebo and **311** for caffeine.
- Problem B: According to the FAA (in 2003), airline passengers average 190 pounds in the summer including clothing and carry-on baggage, with a standard deviation of 35 pounds.
- For a 19-passenger plane, what is the probability that the total weight of passengers exceeds 4000 pounds?
 - Give a range that contains the total passenger weight with 95% probability.
- Problem C: Do Exercise 9.5 and additionally:
- Find the 80%, 90%, and 99% confidence intervals. Explain how the width of the interval is affected by the level of confidence.
 - Suppose the random sample was 20 modules, and find the 95% confidence interval. Find the 95% confidence interval if the sample was 300 modules. Explain how the width of the interval is affected by the sample size.
 - Suppose the standard deviation was 0.006 instead of the 0.0015 given. Find the 95% confidence interval. Explain how the width of the interval is affected by the population SD.
- Problem D: A 1992 J.AMA study of 92 healthy adults found a mean body temperature of 98.5°F with a 95% confidence interval of [98.37, 98.63]. Explain what is wrong with the following statements:
- 95% of healthy adults have a body temperature between 98.37 and 98.63.
 - The population mean body temperature falls in the range [98.37, 98.63] 95% of the time.
 - If the same study was repeated many times, 95% of the time the sample mean for the study would fall in the interval [98.37, 98.63].