Lesson #35 · Topic 3E · Practice

Answer Key

1. a. For one random sample of 200 people in France and another random sample of 300 people in Canada, the difference of proportions who speak French as the first language is 0.747.
   b. Approximately normal because $200(0.88) = 176, 200(1-0.88) = 24, 300(0.20) = 60,$ and $300(1-0.20) = 240$ are all ≥ 10 .
   c. Mean = 0.68. For many, many pairs of random samples of size 200 from France and 300 from Canada, the average difference in proportions who speak French as the first language is 0.68.
   d. 10% condition. $200 \leq 10\%$ (population in France), $300 \leq 10\%$ (population in Canada)
   e. Standard deviation = 0.033. When selecting random samples of size 200 from France and 300 from Canada, the difference in sample proportions who speak French as the first language typically varies by 0.033 from the mean of 0.68.

2. a. Mean = 0.40. Standard deviation = 0.049.
   b. Mean = 0.16. Standard deviation = 0.026.
   c. Mean = 0.24. Standard deviation = 0.055.

3. a. Approximately normal because $100(0.829) = 82.9, 100(0.171) = 17.1, 100(0.721) = 72.1,$ and $100(0.279) = 27.9$ are all ≥ 10 . Mean = 0.108. Standard deviation = 0.059.
   b. $P(\hat{p}_1 - \hat{p}_2 > 0.10) = 0.5539$

4. a. The sampling distribution of $\hat{p}_A - \hat{p}_T$ is approximately normal because $80(0.7) = 56,$ $80(0.3) = 24, 50(0.6) = 30, \text{and } 50(0.4) = 20$ are all ≥ 10 . Mean = 0.10. Standard deviation = 0.086. $P(\hat{p}_A - \hat{p}_T < 0) = 0.1225$
   b. No. Because 0.1225 > 0.05, we do not have convincing evidence that the report's claim is not true.

5. C

6. A