Lesson #37 · Topic 4A · Practice

Answer Key

1. a. The population of test scores for all AP Statistics students is skewed to the left with a mean of 81.9 and standard deviation of 15.6.
   b. The shape of the sampling distribution for samples of size 5 is slightly skewed to the left. Because 5 is less than 30, the shape is not approximately normal, but it would be less skewed than the original population distribution.
   c. The shape of the sampling distribution for samples of size 35 is approximately normal because the sample size of $35 \geq 30$, so the central limit theorem applies.

2. a. Approximately normal, because of the central limit theorem $(50 \geq 30)$.
   b. Mean = 141.8 milliseconds. Standard deviation = 9.76 milliseconds.
   c. 0.1131.
   d. Shape: no longer approximately normal (it would be slightly skewed right). Center: stays the same at 141.8 milliseconds. Standard deviation would increase to 21.82 milliseconds.

3. a. The shape of the sampling distribution is approximately normal according to the central limit theorem because the sample size of $40 \geq 30$. The mean is $117,000 and the standard deviation is $5,850.213.
   b. 0.0018.
   c. Yes, because 0.0018 < 0.05, we have convincing evidence that the mean salary for management positions at this large company is lower than the national average.

4. a. The shape for 1st hour is slightly skewed to the right and the shape of 2nd hour is approximately normal according to the central limit theorem. Both sampling distributions have the same mean of 25.3 text messages. The standard deviation for 1st hour is larger (2.8) than the standard deviation for 2nd hour (1.4).
   b. It would be more likely for a sample of 16 students to have a sample mean greater than 30 text messages than a sample of 64 students. The smaller sample size results in more variability in the sample means, so it is more likely to have a sample mean further from the true mean than with the sample of 64 students.

5. B

6. A