Lesson 7/8.1.2 Practice Problems

1. Seventeen percent of reported fires in the U.S. are vehicle fires (Stuckey & Kereselidze, 2007). Suppose you sample the reports of 70 fires in the U.S.
   a. Find the mean, \( \mu_p \), and standard error, \( \sigma_p \), of the resulting sampling distribution of sample proportions, \( \hat{p} \).
   b. Is the sampling distribution of \( \hat{p} \) approximately normal?
   c. What is the probability that at least 14 of the sampled fires would be vehicle fires?

   a. Find the mean, \( \mu_p \), and standard error, \( \sigma_p \), of the resulting sampling distribution of sample proportions, \( \hat{p} \).
   b. Is the sampling distribution of \( \hat{p} \) approximately normal?
   c. What is the probability that less than 60 of these taxpayers would be expecting a tax refund?

3. A multiple choice exam consists of 50 questions, each question having 4 choices. Suppose a student taking the test is just guessing at the answers.
   a. Let \( \hat{p} \) be the proportion of answers the student gets correct. Find the mean, \( \mu_p \), and standard error, \( \sigma_p \), of the resulting sampling distribution of sample proportions, \( \hat{p} \).
   b. Is the sampling distribution of \( \hat{p} \) approximately normal?
   c. What is the probability that the student passes the exam if 60% is a passing grade?

4. Sixty percent of women and 75% of men are in the labor force (U.S. Bureau of Labor Statistics, 2008). Suppose samples of 200 men and 200 women are taken
   a. Let \( \hat{p} \) be the sample proportion of women in the labor force. Find the mean, \( \mu_p \), and standard error, \( \sigma_p \), of the resulting sampling distribution of sample proportions, \( \hat{p} \).
   b. Is the sampling distribution of \( \hat{p} \) approximately normal?
   c. What is the probability that at least 140 of these women are in the labor force?
   d. Let \( \hat{p} \) be the sample proportion of men in the labor force. Find the mean, \( \mu_p \), and standard error, \( \sigma_p \), of the resulting sampling distribution of sample proportions, \( \hat{p} \).
   e. Is the sampling distribution of \( \hat{p} \) approximately normal?
f. What is the probability that at least 140 of these men are in the labor force?
Answer

1. a. 0.17, 0.034
   b. Yes
   c. 0.189
2. a. 0.31, 0.037
   b. Yes
   c. 0.984
3. a. 0.25, 0.061
   b. Yes
   c. 0.000
4. a. 0.6, 0.035
   b. Yes
   c. 0.002
   d. 0.75, 0.031
   e. Yes
   f. 0.949