

**1)** The Transportation Security Administration (TSA) is responsible for airport safety. On some flights, TSA officers randomly select passengers for an extra security check before boarding. One such flight had 76 passengers—12 in first class and 64 in coach class. TSA officers selected an SRS of 10 passengers for screening. Let  $\hat{p}$  be the proportion of first-class passengers in the sample.

- (a) Is the 10% condition met in this case? Justify your answer.
- (b) Is the normal condition met in this case? Justify your answer.

**2)** In the game of scrabble, each player begins by drawing 7 tiles from a bag containing 100 tiles. There are 42 vowels, 56 consonants, and 2 blank tiles in the bag. You choose an SRS of 7 tiles. Let  $\hat{p}$  be the proportion of vowels in your sample.

- (a) Is the 10% condition met in this case? Justify your answer.
- (b) Is the normal condition met in this case? Justify your answer.

**3)** The Gallup Poll asked a random sample of 1785 adults whether they attended church or synagogue during the past week. Of the respondents, 44% said they did attend. It has been known that 40% of the adult population actually went to church or synagogue. Let  $\hat{p}$  be the proportion of people in the sample who attended church or synagogue.

- (a) What is the mean of the sampling distribution of  $\hat{p}$ ? Why?
- (b) Find the standard deviation of the sampling distribution of  $\hat{p}$ . Check to see if the 10% condition is met.
- (c) Is the sampling distribution of  $\hat{p}$  approximately normal? Check to see if the normal condition is met.
- (d) Find the probability of obtaining a sample of 1785 adults in which 44% or more say they attended church or synagogue last week. Do you have any doubts about the result of this poll? Explain.

**4)** Harley-Davidson motorcycles make up 14% of all motorcycles registered in the United States. You plan to interview an SRS of 500 motorcycle owners. How likely is your sample to contain 20% or more who own Harleys?

**Multiple Choice (Questions 5 -7):**

The magazine Sports Illustrated asked a random sample of 750 Division I college athletes, “Do you believe performance-enhancing drugs are a problem in college sports?” Suppose that 30% of all Division I athletes think that these drugs are a problem. Let  $\hat{p}$  be the sample proportion who say that these drugs are a problem.

**5)** The sampling distribution of  $\hat{p}$  has mean

- (a) 225
- (b) 0.30
- (c) 0.017
- (d) 0
- (e) None of these.

**6)** The standard deviation of the sampling distribution is about

- (a) 0.0006
- (b) 0.033
- (c) 0.017
- (d) 1
- (e) None of these.

**7)** The sampling distribution of  $\hat{p}$  is approximately normal because

- (a) there are at least 7570 Division I college athletes.
- (b)  $np = 225$  and  $n(1-p) = 525$
- (c) a random sample was chosen
- (d) a large sample size like  $n = 750$  guarantees it.
- (e) the sampling distribution of  $\hat{p}$  always has this shape.

**Blast from the past (Chapter 6):**

**8)** A sample survey reports that 29% of Internet users download music files online, 21% share music files from their computers, and 12% both download and share music. What percent of Internet users neither download nor share music files?