

Homework 6 Solutions

Chapter 9: #25, 37

Chapter 9: #51, 87

Chapter 7: #67, 73

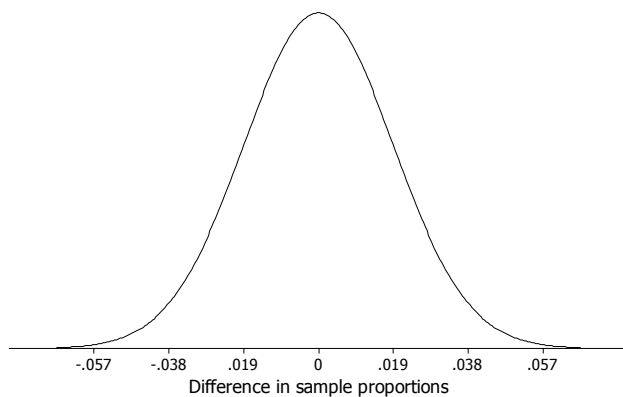
Assigned Mon, November 2

- 9.25
- The population proportion would not change. It is the proportion of all adults in the population that buys organic vegetables.
 - The sample proportion would change for each sample because the sample includes a different set of 1000 people each time.
 - The standard deviation of \hat{p} would not change. It is based on the population proportion, which stays fixed, and on the sample size, which is 1000 for each of the samples.
 - The standard error would change because it is an estimate of the standard deviation of the sampling distribution, and it uses the sample data, which changes for each sample.
 - The sampling distribution of \hat{p} remains the same for all samples of the same size (1000 in this case) from the same population.
- 9.37
- Mean = .70; s.d. (\hat{p}) = $\sqrt{\frac{.70(1-.70)}{200}} = .0324$.
 - $.70 \pm (3 \times .0324)$, or .6028 to .7972.
 - $\hat{p} = 120/200 = .60$. This is a statistic.
 - The value .60 is slightly below the interval of possible sample proportions for 99.7% of all random samples of 200 from a population where $p = .70$. In other words, the sample proportion is unusually low if the true proportion were .70. Probably the population value is actually less than .70.

Assigned Wed, November 4

- 9.51
- The proportion of the population of urban elementary school children who are obese.
 - The proportion of the 900 children sampled from urban elementary schools who are obese.
 - The sampling distribution is approximately normal with mean of 0 and standard deviation of $\sqrt{\frac{.2(.8)}{900} + \frac{.2(.8)}{900}} = .019$
 - The sampling distribution has mean 0 and standard deviation .019.

Figure for Exercise 9.51d



$$9.87 \quad z = \frac{\hat{p} - p}{s.d.(\hat{p})} = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}} = \frac{.64 - .50}{\sqrt{\frac{.50(1-.50)}{75}}} = \frac{.14}{.0577} = 2.426.$$

Assigned Fri, November 6

- 7.67** Your answer should mention something regarding the specific people versus random individuals. For instance, the probability of giving birth to quintuplets does not apply to males. The probability of winning the lottery is 0 for people who don't buy tickets.
- 7.73** Your answer should talk about how coincidences are not really unlikely if you ask about something like that happening to someone at some time. Your friend should not take the fact that she dreamt about a bombing the day before one actually occurred as a warning. Although the chance of this happening to your friend on that particular day is small, the chance of someone, somewhere in the world dreaming about a bombing that night is actually quite high, when you consider the large population of the world. Also, if your friend routinely remembers her dreams, and dreams about many different topics, it's likely that on occasion something that she dreams about will actually happen soon after the dream, just by chance.