Lesson 9.2.2 Practice Problems

1. Voters in a small town were asked if they supported the actions of the current mayor. Out of 110 men asked, 59 said yes and out of 146 women, 71 said yes. Calculate a 90% confidence interval for the difference between the proportions of men and women supporting the mayor’s actions.

2. Out of a sample of 480 faculty from public community colleges, 259 were women. Out of a sample of 620 faculty from public bachelor’s institutions, 279 were women. (Data simulated from Faculty Pay 2006-2007, 2008) Determine a 99% confidence interval for the difference in proportions of women among public community colleges and public bachelor’s institutions.

3. Samples of Democrats and Republicans were asked if they viewed protecting the environment as a top priority. Out of 521 Democrats 349 said yes. Out of 427 Republicans 175 said yes. (Data simulated from Kohut, 2007.) Determine a 99% confidence interval for the difference between the proportions of Democrats and Republicans who view protecting the environment as a top priority.

4. Samples of 53 women and 47 men were asked “Do you prefer to hear the good news or the bad news first?” Twenty-one of the women and 15 of the men said they would prefer to hear the good news first. (Data simulated from Poretz & Sinrod, 1989, p.48.) Calculate a 95% confidence interval for the difference between the proportions of women and men who would prefer to hear the good news first.
Answers

1. \( \hat{p}_1 = 0.536 \)
   \( \hat{p}_2 = 0.486 \)
   \( s_{\hat{p}_1 - \hat{p}_2} = 0.063 \)
   \( Z_c = 1.645 \)
   \( E = 0.104 \)
   \( 0.050 \pm 0.104 \)
   \( -0.054 \text{ to } 0.154 \)

2. \( \hat{p}_1 = 0.54 \)
   \( \hat{p}_2 = 0.45 \)
   \( s_{\hat{p}_1 - \hat{p}_2} = 0.0303 \)
   \( Z_c = 2.576 \)
   \( E = 0.078 \)
   \( 0.090 \pm 0.078 \)
   \( 0.012 \text{ to } 0.168 \)

3. \( \hat{p}_1 = 0.670 \)
   \( \hat{p}_2 = 0.410 \)
   \( s_{\hat{p}_1 - \hat{p}_2} = 0.0315 \)
   \( Z_c = 2.576 \)
   \( E = 0.081 \)
   \( 0.260 \pm 0.081 \)
   \( 0.179 \text{ to } 0.341 \)

4. \( \hat{p}_1 = 0.396 \)
   \( \hat{p}_2 = 0.319 \)
   \( s_{\hat{p}_1 - \hat{p}_2} = 0.0956 \)
   \( Z_c = 2.960 \)
   \( E = 0.187 \)
   \( 0.077 \pm 0.187 \)
   \( -0.110 \text{ to } 0.264 \)