Lesson 7/8.2.2 Practice Problems

1. From a survey of 39 community college students, 27 said they had a job (Coulibaly, 2007). Find a 90% confidence interval for the proportion of community college students who have a job.

2. To determine the chances of winning at least the initial cost of an instant lottery ticket, a researcher sampled 1500 of these lottery tickets. He found that 6 of them paid back something. Determine 99% confidence interval for the proportion of such lottery tickets that pay something.

3. Eighteen out of 82 sampled high school students wore glasses for visual assistance (Trancao, 2007). Determine a 90% confidence interval for the proportion of high school students who were glasses for visual assistance.

4. In September 2007, only 45% of working class households said their incomes were falling behind the cost of living. A survey of 50 working class households in early February 2008 found that 31 of them now felt their incomes were falling behind. (Data simulated from Dimock, Doherty, & Kohut, 2008.) Determine a 99% confidence interval for the proportion of working class households in February 2008 who say their incomes are falling behind the cost of living.

5. A sample of 38 Pacific Northwesterners were asked if they buy coffee for others besides themselves. Seven said they do (Webster, 2007). Determine a 95% confidence for the proportion of Pacific Northwesterners who buy coffee for others besides themselves.
Answers

1. \( \hat{p} = 0.692 \)
   \( s_\hat{p} = 0.074 \)
   \( Z_c = 1.645 \)
   \( E = 0.122 \)
   \( 0.692 \pm 0.122 \)
   \( 0.570 \text{ to } 0.814 \)

2. \( \hat{p} = 0.004 \)
   \( s_\hat{p} = 0.0002 \)
   \( Z_c = 2.576 \)
   \( E = 0.005 \)
   \( 0.004 \pm 0.005 \)
   \( -0.001 \text{ to } 0.009 \)

3. \( \hat{p} = 0.220 \)
   \( s_\hat{p} = 0.046 \)
   \( Z_c = 1.645 \)
   \( E = 0.122 \)
   \( 0.692 \pm 0.122 \)
   \( 0.570 \text{ to } 0.814 \)

4. \( \hat{p} = 0.620 \)
   \( s_\hat{p} = 0.069 \)
   \( Z_c = 2.576 \)
   \( E = 0.178 \)
   \( 0.620 \pm 0.178 \)
   \( 0.442 \text{ to } 0.798 \)

5. \( \hat{p} = 0.184 \)
   \( s_\hat{p} = 0.063 \)
   \( Z_c = 1.960 \)
   \( E = 0.123 \)
   \( 0.184 \pm 0.122 \)
   \( 0.061 \text{ to } 0.307 \)