I want to investigate whether Business students at Cal Poly differ from Engineering students at Cal Poly, with regard to the proportion of students who left California during the break between Fall and Winter quarters this year.

The null hypothesis to be tested can be written as $H_0: \pi_{bus} = \pi_{eng}$.

1. Describe (in words) what $\pi_{bus}$ represents here.

2. State (in symbols) the appropriate alternative hypothesis for testing this research question.

When I asked a sample of students from each college about whether they had left California during the break, I found that 12 of 41 Business students replied “yes,” compared to 32 of 58 Engineering students.

3. Calculate (by hand) the value of the $z$-test statistic.

The p-value of this test can be calculated to be .011.

4. Based on the test statistic and p-value, without performing any additional calculations and without determining a confidence interval, indicate whether a 95% CI for $(\pi_{bus} - \pi_{eng})$ would contain only negative values, only positive values, or some of each. Explain your answer.

5. Summarize your conclusion about the research question stated in the first paragraph.