According to phys.org, Black and Hispanic females are underrepresented in STEM programs compared to non-STEM programs. A certain university would like to see if this is true for their student population. They took a random sample of 300 STEM students and found that 12 were Black or Hispanic females. A separate random sample of 500 non-STEM students had 75 Black or Hispanic females.

Do the data provide convincing evidence that Black and Hispanic females are underrepresented in STEM programs? Use a 5% significance level.

**STATE:** Parameter: Statistic:

Hypotheses: Significance level:

**PLAN:** Name of procedure:

Check conditions:

**DO:** Mean: Standard deviation:

General Formula:

Specific Formula:

Work: Picture:

Test statistic:

P-value:

**CONCLUDE:**
Check Your Understanding

To study the long-term effects of preschool programs for poor children, researchers designed an experiment. They recruited 123 children who had never attended preschool from low-income families in Michigan. Researchers randomly assigned 62 of the children to attend preschool (paid for by the study budget) and the other 61 to serve as a control group who would not go to preschool. One response variable of interest was the need for social services as adults. Over a 10-year period, 38 children in the preschool group and 49 in the control group have needed social services.

1. Do these data provide convincing evidence that preschool reduces the later need for social services for children like the ones in this study? Justify your answer.

2. Based on your conclusion to Question 1, could you have made a Type I error or a Type II error? Explain your reasoning.