

Testing Hypotheses about One Proportion

1. A statistics professor has observed that for several years about 13% of the students who initially enroll in his introductory statistics course withdraw before the end of the semester. A salesman suggests that he try a statistics software package that gets students more involved with computers, predicting that it will cut the dropout rate. The software is expensive, and the salesman offers to let the professor use it for a semester to see if the dropout rate goes down significantly.

During the semester the professor tried using the new software, 203 students signed up for the stats course and 11 dropped out. Should the professor spend the money for this software?
Use $\alpha = .05$.

2. A company is willing to renew its advertising contract with a local radio station only if the station can prove that more than 20% of the residents of the city have heard the ad and recognize the company's product. The radio station conducts a random phone survey of 600 people, and of the 600 people surveyed only 133 remember the ad. Based on these results, will the company renew its advertising contract with the radio station? Use $\alpha = .10$. Would the test be significant at the $\alpha = .05$ level?

3. A Vermont study published in December 2001 by the American Academy of Pediatrics examined parental influence on teenagers' decisions to smoke. A group of students who had never smoked were questioned about their parents' attitudes toward smoking. These students were questioned again two years later to see if they had started smoking. The researchers found that among the 284 students who indicated that their parents disapproved of kids smoking, 54 had become established smokers. Among the 41 students who initially said their parents were lenient about smoking, 11 became smokers. Do these data provide evidence that parental attitude influences teenagers' decisions about smoking?