Comparing Two Proportions **Math 121 - Workshop**

In 2002 the Supreme Court ruled that schools could require random drug tests of students participating in competitive after-school activities such as athletics. Does drug testing reduce use of illegal drugs? A study compared two similar high schools in Oregon. Wahtonka High School tested athletes at random and Warrenton High School did not. In a confidential survey, 7 of 135 athletes at Wahtonka and 27 of 141 athletes at Warrenton said they were using drugs.

1. What are the explanatory and response variables in this situation?

2. State the appropriate null and alternative hypotheses for testing whether there is statistically significant difference between the proportions of athletes who use drugs at the two schools.

3. In this example, what is the pooled proportion $\hat{p}$ and what does it represent in words?

4. Conduct the appropriate test of significance. Report the test statistic and the p-value, and explain what they mean.

5. Use a confidence interval to estimate how much difference drug testing appears to make in the percent of student athletes using drugs.

6. Were the sample sizes for this study big enough to trust a 2-sample hypotheses test for proportions? What about a two sample confidence interval for proportions?

7. Was this an observational study or an experiment?

8. Is it safe to conclude that the explanatory variable causes the difference in the response variable? Why or why not?