STAT 350 Homework #12 (Instructor: Dr. Sarah Sellke)
Due Monday April 15th, 2013 at the Beginning of the class

8.45 Mathematician tosses coin 10,000 times! The South African mathematician John Kerrich, while a prisoner of war during World War II, tossed a coin 10,000 times and obtained 5067 heads.

(a) Is this significant evidence at the 5% level that the probability that Kerrich's coin comes up heads is not 0.5?

(b) Give a 95% confidence interval to see what probabilities of heads are roughly consistent with Kerrich's result.

8.74 A corporate liability trial. A major court case on liability for contamination of groundwater took place in the town of Woburn Massachusetts. A town well in Woburn was contaminated by industrial chemicals. During the period that residents drank water from this well, there were 16 birth defects among 414 births. In years when the contaminated well was shut off and water was supplied from other wells, there were 3 birth defects among 228 births. The plaintiffs suing the firms responsible for the contamination claimed that these data show that the rate of birth defects was higher when the contaminated well was in use.[24] How statistically significant is the evidence? Be sure to state what assumptions your analysis requires and to what extent these assumptions seem reasonable in this case.

8.77 Gender bias in textbooks. To what extent do textbooks on syntax (analysis of sentence structure) display gender bias? A study of this question sampled sentences from 10 texts.[25] One part of the study examined the use of the words "girl," "boy," "man," and "woman." Call the first two words *juvenile* and the last two *adult*. Is the proportion of female references that are juvenile ("girl" rather than "woman") equal to the proportion of male references that are juvenile ("boy" rather than "man")? Here are data from one of the texts:

Gender	n	X (juvenile)
Female	60	48
Male	132	52

(a) Carry out the test and summarize the results.

(b) Give a 95% confidence interval for the difference and interpret it.