1. The Parent & Teens 2006 Survey of 935 12- to 17 year-olds found that among teens aged 15-17, 70% of the girls surveyed had used an online social network, compared to 55% of the boys. The report on this survey claims that the difference is statistically significant. Explain what they mean by that.

2. The Centers for Disease Control and Prevention reported in a survey of randomly selected U.S. seniors age 65 of older that 411 of 1012 men and 535 of 1062 women suffered from some form of arthritis.

   a. Are the conditions for inference satisfied?

   b. Do these data indicate that more women of age 65 and older are affected by arthritis than men in the same age group? Carry out a two-proportion z-test to answer the question.
3. In 1997 a random sample of 200 low income families was taken and it was found that 43 of them have children who have no health insurance. In 2003 a similar survey of 270 families was taken and 42 were found not to have insurance. Follow the steps below to determine whether there is evidence from these samples that the proportion of low income children without insurance has changed. Use a 10% significance level.

a. State the null and alternative hypotheses.

b. Are the conditions satisfied for inference?

c. State your conclusion in context using the results from the confidence interval and the z-test shown in the computer output below:

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Test and CI for Two Proportions

Sample X N Sample P
1997 43 200 0.2150
2003 42 270 0.1555

Estimate for difference: 0.3706
90% CI: (-0.0006, 0.1194)
Test for difference = 0 (vs ≠ 0): z = 1.655    p-value: 0.0978
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4. In a homework problem you had following Class 6, you considered the results of a clinical trial comparing the effectiveness of two drugs, Lithium and Imipramine, in preventing a recurrence of depression among patients who were hospitalized with depression. Here is the two-way table you should have constructed at that time:
You previously used EDA (conditional row percents, a double bar chart) to investigate the relationship between drug and the frequency of recurrence. Now you can use a hypothesis test to determine whether the apparent advantage of Imipramine shown in the data above could simply be due to chance.

a. Once again compute the conditional row percents. These now represent the sample proportions $\hat{p}_1$ and $\hat{p}_2$.

b. State the null and alternative hypotheses, check the conditions, and then compute the test statistic and p-value for the data.

c. Does the data give convincing evidence that Imipramine is better than Lithium at preventing a recurrence of depression?