Econ 222-01
2013-2014 Spring
Homework IV
Due Date: March 28th.

1) We test $H_1 : \sigma_1^2 \neq 2\sigma_2^2$ against $H_0 : \sigma_1^2 = 2\sigma_2^2$ at a significance level of 0.05. It is know that both populations are approximately normally distributed. Independent random sampling from both populations yield:

Sample 1 :	19,	26,	24,	26,	16,	26,	7,	2,	9,	27
Sample 2 :	33,	32,	33,	37,	32,	38,	33,	38 .		

a. Using the table we distributed in class (also available on the course WEB page) find an interval for the p-value corresponding to the above samples.

b. Using a spreadsheet program, find the exact value of the p-value corresponding to the above samples.

2) Consider a large box which contains many white and black balls. We have forgotten the percentage of white balls in the box, but remember that it is either 1/3 or 2/3. Even though we do not know the percentage of white balls in the box we strongly believe that it is 1/3 (but also know that it might be 2/3). Hence we decide to test if the percentage of white balls in the box is 2/3. For this purpose we draw 20 balls at random with replacement and note their color.

a. What are the hypotheses of this test?

b. What is the test statistic that you would use for this test?

c. What is the distribution of the test statistic that you plan to use?

d. What is the decision rule?

e. If the sample you observed was: (W stands for a white and B stands for a black ball)

$$W\,W\,W\,B\,B\,W\,B\,W\,B\,W\,B\,B\,W\,B\,W\,B\,W\,W\,W\,W$$

what would your conclusion be?

f. What is the p-values corresponding to the above sample?