1) Seven students went on a diet in an attempt to lose weight, with the following results:

	Ann	Ed	Joe	Max	Phil	Ron	Tina
Weight Before:	144	191	178	182	206	185	168
Weight After:	135	186	165	178	210	171	158

Of interest is testing whether the diet is an effective means of losing weight.

(a) Test the appropriate hypotheses using the sign test, keeping the significance level at no more than 0.05. Give your decision rule, test statistic value, p-value, and conclusion.
(b) Test the appropriate hypotheses using the Wilcoxon signed rank test, keeping the significance level at 0.05. Give your decision rule, test statistic value, an approximate p-value, and conclusion.

2) Suppose that 22 randomly selected customers were asked to taste each of two types of soda and declare their preference. Seven customers preferred Mr. Pibb, 12 preferred Dr. Pepper, and 3 had no preference. Using the sign test, determine whether there is a significant difference in preference. Keep the significance level at 0.05 or less. Give your decision rule, test statistic value, p-value, and conclusion.

3) Two helicopter landing fields were observed each day for a one-year period to determine whether there was a significant difference in availability between the two fields. On 286 days both fields were available; on 62 days both fields were closed; on 14 days Field A was closed while Field B was open; on 3 days, Field B was closed while Field A was open. Is there a significant difference in availability for the two fields? Keep the significance level at no more than 0.05. Give your decision rule, test statistic value, p-value, and conclusion.

4) Consider the following random sample of distances from accident sites to a particular rescue station: 7.6,0.3,7.3,4.9,6.7,2.2,6.1,1.1,3.4,4.2,2.2,3.9,4.4,7.1. Using the Wilcoxon signed-rank CI procedure, find a 95% confidence interval for the population median distance.

5) A random sample of 12 basketball players was asked to shoot 25 free throws before and after rigorous exercise. The number of successful free throw attempts by each player was as follows:

Player	1	2	3	4	5	6	7	8	9	10	11	12
Before	18	12	7	21	19	14	8	11	19	16	8	11
After	16	10	8	23	13	10	8	13	9	8	8	5

Of interest is testing whether the free throw success rate tends to decrease when the players are tired. Test the appropriate hypotheses using the Wilcoxon signed rank test, keeping the significance level at 0.05. Give your decision rule, test statistic value, an approximate p-value, and conclusion.

6) Ten randomly selected men and nine randomly selected women were tested to determine their most comfortable room temperature. The results were: Men: 74,72,77,76,76,73,75,73,74,75. Women: 75,77,78,79,77,73,78,79,78. Using an appropriate nonparametric procedure:
(a) Test whether the average comfortable temperature is the same for men and women. Use $\alpha = 0.05$. Give your decision rule, test statistic value, approximate p-value, and conclusion.
(b) Give a 95% confidence interval for the difference in mean comfortable temperatures for men and women.

7) [Required for graduate students, extra credit for undergraduates] In the Wilcoxon signed rank test, the "zero differences" are discarded when performing the hypothesis test. Explain why it is better to include the zero differences when finding a confidence interval for the median difference.