Math 108 **Exam 3** **Spring '98**

1. The minitab worksheet e3-1 gives scores on two standardized tests taken by the same individuals. The second test covers more advanced material, and is supposed to be harder. You wish to see if this is true, at least on average.
   a) What are t and P for this study? What do you conclude?
   b) Give a 95% confidence interval for the difference in the means for the two tests.

2. A new treatment for high blood pressure is tested. The patients are randomly divided into two groups. One group gets the new treatment, and the other gets the old treatment. The results are as follows. Here $\bar{x}$ is the average systolic blood pressure for each group:

	n	$\bar{x}$	s
New treatment group	240	126	25
Old treatment group	235	130	23

   a) You wish to show that the new treatment lowers blood pressure more than the old one. So what are your null and alternative hypotheses?
   b) What are the values of t and P? What do you conclude?
   c) Give a 90% confidence interval for the difference in the average blood pressures for patients under the two treatments.

3. A new procedure is developed to try to lower the standard deviation for a certain variable. Under the standard procedure, we have $\sigma = 40$. A test of the new procedure gives $s = 30$ with a sample size of 16.
   a) What are χ^2 and P?
   b) Give a 90% confidence interval for the standard deviation under the new procedure.

4. A die is tested for fairness. Here are the results:

number on die	1	2	3	4	5	6
observed freq.	45	32	37	46	36	44

   What are χ^2 and P? What do you conclude?

5. A survey is done to see if voting and gender are independent. The results are as follows:

	Men	Women
Voted	40	64
Didn't vote	160	130

What are χ^2 and P? What do you conclude?