

# Math 320 Homework 9 - Spring 1998

Due Friday, March 20, 1998

**Name:**

1. Do exercise 7.42 on page 325.
2. Do exercise 7.44 on page 325.
3. Keeping the same  $H_0$ ,  $H_1$  and level of significance of the preceding exercise, suppose that the sample size is 100. What then is the power of the test? Say explicitly whether you calculate exactly using Excel or a calculator or using the normal approximation. What do you conclude increasing sample size does to the power?
4. Do exercise 7.48 on page 335. State which test you are using and why it is justified.
5. (Like exercise 7.50 on page 335). Ten high school seniors taking the ACT test received the following scores: 23, 24, 25, 26, 27, 27, 28, 29, 30, 31. In the past, ACT scores at their high school have been normally distributed with  $\mu = 25$  and  $\sigma = 4$ . Assume that the standard deviation for the school remains equal to 4.  
  
At the  $\alpha = .05$  level of significance, test the null hypothesis  $H_0 : \mu = 25$  versus  $H_1 : \mu \neq 25$ . Describe what you are doing. For example, are you doing an upper-, lower- or two-tailed test? What is the test statistic and what is its null distribution? State the decision rule and the decision.
6. Do exercise 7.72 on page 346.
7. Do exercise 7.74 on page 346.
8. Do exercise 8.6 on page 360. Use Excel to make a scatterplot for this paired data similar to the one in Figure 8.2. Does the scatterplot support the decision reached in your paired t-test? Explain.