STAT 400 SUMMER II 2001 (PROFESSOR GREEN)
SOLUTIONS TO PROBLEMS DUE AUGUST 23

40.

(a) The test statistic takes the value 3.05, giving a two-sided P-value of .004. The null hypothesis is rejected in favor of the alternative hypothesis.

(b) The test statistic now takes the value .57 with 29 degrees of freedom. The two-sided P-value is now about .6, which would indicate no significant difference. Of course this procedure is not valid since it is not reasonable to regard the two samples as independent.

42. The test statistic (taken in the positive sense) is 2.2, giving a P-value of .028 with nine degrees of freedom. At significance level .05, the conclusion is that exposure does affect spacial ability.

44. We test $\bar{D} = 500$ against $\bar{D} > 500$. The test statistic takes the value 3.58, for a P-value of .004 with eight degrees of freedom. This constitutes strong evidence that the difference in yield is more than 500 kg/ha.

48.

(a) The test statistic takes the value $z = 4.84$, clearly in the rejection region $|Z| > 1.96$.

(b) The probability of rejecting the null hypothesis in this case is about .998.

50. At the 95% confidence level, the difference between the (larger) proportion of satisfied elementary school teachers and the proportion of satisfied high school teachers is between .016 and .171.

54. Discussed at length in class.