

# Statistics Final Exam Review

## Hypothesis Testing

1. Tree-ring dating from archaeological excavation sites is used in conjunction with other chronologic evidence to estimate occupation dates of prehistoric Indian ruins in the southwestern United States. It is thought that Burnt Mesa Pueblo was occupied around 1300 A.D. (based on evidence from potsherds and stone tools). Sample data of 10 tree-ring dates (A.D.) from adjacent archaeological sites (*Bandelier Archaeological Excavation Project: Summer 1990 Excavations at Burnt Mesa Pueblo*, edited by T. Kohler, Washington State University Department of Anthropology) was used to determine an average date of  $\bar{x} = 1268$  and standard deviation  $s \approx 37.29$  years. Assuming the tree-ring dates in this excavation area follow a distribution that is approximately normal, does this information indicate that the population mean of tree-ring dates in the area is different from (either higher or lower than) that in 1300 A.D.? Use a 1% level of significance.
  - (a) State the null and alternate hypotheses.
  - (b) What sampling distribution do you use for  $\bar{x}$ ? Convert the sample test statistic  $\bar{x} = 1268$  for use with the sampling distribution you stated.
  - (c) Find the  $P$ -value or the interval containing the  $P$ -value.
  - (d) Conclude the test.
  - (e) Interpret the results in the context of the problem.