

Chapters 16 and 17 Review Problems

- 1) Acid rain from the burning of fossil fuels has caused many of the lakes around the world to become acidic. The biology in these lakes often collapses because of the rapid and unfavorable changes in water chemistry. A lake is classified as non-acidic if it has a pH greater than 6. Two researchers measured the pH of high mountain lakes in the Southern Alps. The pH levels obtained for 15 of those lakes appear below.

7.2	7.3	6.1	6.9	6.6
7.3	6.3	5.5	6.3	6.5
5.7	6.9	6.7	7.9	5.8

- a) Make a stemplot of the data. Are there any outliers or strong skewness that might prevent the use of the t procedures?
- b) Give a 95% confidence interval for μ , the mean pH level of high mountain lakes in the Southern Alps. (Note: $\bar{x} = 6.6$ and $s = 0.672$.)
- c) Is there evidence that, on average, high mountain lakes in the Southern Alps are non-acidic? Perform the appropriate test of significance. State your hypotheses, compute the test statistic, calculate a P -value, and state your conclusion in terms of the problem.
- 2) Independent samples of adolescent offspring of diabetic mothers (ODM) and non-diabetic mothers (ONM) were taken and evaluated for potential differences in blood pressure. The following summary statistics are for the systolic blood pressures, in mm Hg, of the 99 ODM participants and the 80 ONM participants.

ODM	ONM
$\bar{x}_1 = 118$	$\bar{x}_2 = 110$
$s_1 = 12.04$	$s_2 = 11.25$
$n_1 = 99$	$n_2 = 80$

- a) Give a 99% confidence interval for the difference, $\mu_1 - \mu_2$, between the mean systolic blood pressure of ODM children and ONM children.
- b) Is there evidence that the mean systolic blood pressure of ODM children is different from that of ONM children? Perform the appropriate test of significance. State your hypotheses, compute the test statistic, calculate a P -value, and state your conclusion in terms of the problem.