

- 2-15. The diameter of a ball bearing was measured by 12 inspectors, each using two different kinds of calipers. The results were

Inspector	Caliper 1	Caliper 2
1	0.265	0.264
2	0.265	0.265
3	0.266	0.264
4	0.267	0.266
5	0.267	0.267
6	0.265	0.268
7	0.267	0.264
8	0.267	0.265
9	0.265	0.265
10	0.268	0.267
11	0.268	0.268
12	0.265	0.269

- (a) Is there a significant difference between the means of the population of measurements from which the two samples were selected? Use  $\alpha = 0.05$ .
- (b) Construct a 95 percent confidence interval on the difference in mean diameter measurements for the two types of calipers.
- 2-16. An article in the *Journal of Strain Analysis* (vol. 18, no. 2, 1983) compares several procedures for predicting the shear strength for steel plate girders. Data for nine girders in the form of the ratio of predicted to observed load for two of these procedures, the Karlsruhe and Lehigh methods, are as follows:

Girder	Karlsruhe Method	Lehigh Method
S1/1	1.186	1.061
S2/1	1.151	0.992
S3/1	1.322	1.063
S4/1	1.339	1.062
S5/1	1.200	1.065
S2/1	1.402	1.178
S2/2	1.365	1.037
S2/3	1.537	1.086
S2/4	1.559	1.052

- (a) Is there any evidence to support a claim that there is a difference in mean performance between the two methods? Use  $\alpha = 0.05$ .
- (b) Construct a 95 percent confidence interval for the difference in mean predicted to observed load.

- 2-17. The deflection temperature under load for two different formulations of ABS plastic pipe is being studied. Two samples of 12 observations each are prepared using each formulation and the deflection temperatures (in °F) are reported below:

Formulation 1			Formulation 2		
206	193	192	177	176	198
188	207	210	197	185	188
205	185	194	206	200	189
187	189	178	201	197	203

- (a) Does the data support the claim that the mean deflection temperature under load for formulation 1 exceeds that of formulation 2? Use  $\alpha = 0.05$ .
- 2-18. Refer to the data in Problem 2-17. Do the data support a claim that the mean deflection temperature under load for formulation 1 exceeds that of formulation 2 by at least 3°F?