

Chapters 10 and 11 Worksheet 1

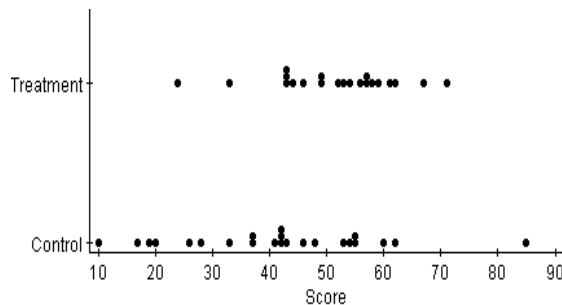
Hypothesis Tests Involving Two Populations

1. Regents Insurance Corporation provides financial services for people in Wisconsin and Ohio. At a recent sales meeting, the statement was made that there is no difference in the mean life insurance coverage for clients in these two states. It was decided that a test of this claim should be made as the conclusion could affect a new promotion campaign that was being planned.

To test the claim, random samples of Wisconsin clients and of Ohio clients were selected, yielding the results below. The standard deviations were obtained from previously collected historical data.

| Wisconsin | | Ohio |
|-----------|---------|----------|
| 60 | n | 80 |
| \$25,600 | mean | \$32,300 |
| \$8,100 | std dev | \$9,200 |

- a) Testing at the 5% level of significance, what conclusion should Regents draw?
- b) What p-value is associated with this sample result?
2. Recall the Reading data set from the *StatCrunch* Guided Tours booklet. It was derived from an experiment that tested whether additional reading activities help elementary school students improve their reading ability. A *treatment* class of 21 third-grade students participated in extra reading activities for eight weeks, and a *control* class of 23 third-graders followed the same curriculum without the extra activities. After eight-weeks, students took a Degree of Reading Power (DRP) test which measured the aspects of reading ability that the treatment was designed to improve. We used *StatCrunch* to produce the following.



Summary statistics for Score grouped by Group

| Group | n | Mean | Variance | Std. Dev. | Median | Range | Min | Max | Q1 | Q3 |
|-----------|----|----------|-----------|-----------|--------|-------|-----|-----|----|----|
| Control | 23 | 41.52174 | 294.07904 | 17.148733 | 42 | 75 | 10 | 85 | 28 | 54 |
| Treatment | 21 | 51.47619 | 121.1619 | 11.007357 | 53 | 47 | 24 | 71 | 44 | 58 |

- a) Testing at the 5% level of significance, what conclusion should be drawn?
- b) What p-value is associated with this sample result?
3. An analyst for Textbooks America believes that undergraduates are no more likely to buy used textbooks than are graduate students. Their marketing department selected a random sample of 200 undergraduate students and 100 graduate students. Each was asked whether they had purchased a used textbook during the current semester. Sixty-one undergraduate students and twenty-one graduate students had purchased a used book during the current semester.

a) Complete the *contingency table* below.

| | Undergraduate | Graduate | Total |
|----------------------------|---------------|----------|-------|
| had bought used | | | |
| had <i>not</i> bought used | | | |
| Total students interviewed | | | |

b) Testing at the 3% level of significance, what should Textbooks America conclude?