Chapter 4 Review AP Statistics Name:

**Directions:** *Work on these sheets.*

**1.** The following numbers appear in a table of random digits:

38683 50279 38224 09844 13578 28251 12708 24684

A scientist will be measuring the total amount of leaf litter in a random sample (n = 5) of

forest sites selected without replacement from a population of 45 sites. The sites are labeled

01, 02, . . . , 45 and she starts at the beginning of the line of random digits. What is her sample?

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**2.** For each of the following types of sample, give an example

(a) voluntary response sample.

 (b) stratified sample.

 (c) simple random sample.

 (d) cluster sample.

 (e) convenience sample

**3.** For each of the following experimental designs, describe its major distinguishing feature

 (a) Completely randomized

 (b) Block design

 (c) Matched pair (2 types)

**4.** Explain each of the following types of bias:

 (a) Nonresponse bias

 (b) Response bias

 (c) Undercoverage bias

 (d) Question bias

**5.** A sporting goods manufacturing company wants to test two versions of their dryer sheets. They also think that the effectiveness of the dryer sheets will be affected by whether it is a gas or electric dryer. Washed clothes are randomly assigned to one of the four treatments.

1. What are the experimental units/subjects
2. What are the factors?

**6.** As a researcher for a pharmaceutical company, you are designing a study to test the

effectiveness of a new treatment for migraine headaches. You have been given a list of 126

people willing to participate in the trial. The first 70 people are female; the remaining 56 are

male.

(a) Preliminary research suggests that men and women respond differently to this new

treatment. What sort of experimental design would you choose for this study, and why?

(b) Outline a design for this experiment.

**7.** A study was being conducted for men to see if vasectomies had any effect on the occurrence of prostate cancer. A large medical practice randomly selected 500 of their male patients between the ages of 60 and 70 to find out which patients had undergone vasectomies and which had contracted prostate cancer.

 (a) Is this an observational study an experiment? Explain why or why not.

 (b) Identify the sample and the population in this study.

1. The medical practice wants to do more in-depth study with ten subjects from the sample, five men that had vasectomies and five that had not. The original sample had 200 men who had vasectomies and 300 who had not. Use line 142 of the random digits table to select the 10 men for the in-depth study. Describe the method you used to select the men and women.

**8.** Does ginkgo improve memory? The law allows marketers of herbs and other natural substances to make health claims that are not supported by evidence. Brands of ginkgo extract claim to “improve memory and concentration.” A randomized comparative experiment found no statistically significant evidence for such effects. The subjects were 230 healthy volunteers over 60 years old. They were randomly assigned to ginkgo or a placebo pill (a dummy pill that looks and tastes the same). All the subjects took a battery of tests for learning and memory before treatment started and again after six weeks. Using the random digits below (starting at line 103), choose the first four members of the ginkgo group. Explain your method.

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| **103** | 45467 | 71709 | 77558 | 00095 | 32863 | 29485 | 82226 | 90056 |
| **104** | 52711 | 38889 | 93074 | 60227 | 40011 | 85848 | 48767 | 52573 |
| **105** | 95592 | 94007 | 69971 | 91481 | 60779 | 53791 | 17297 | 59335 |
| **106** | 68417 | 35013 | 15529 | 72765 | 85089 | 57067 | 50211 | 47487 |