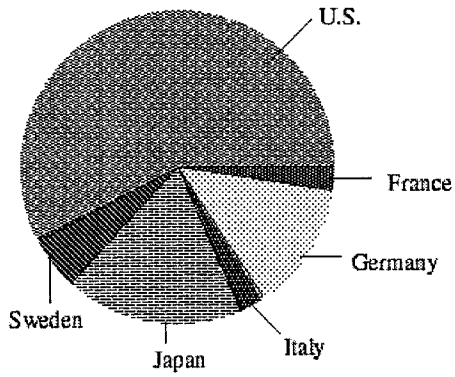
Test 1A AP Statistics Name:

Directions: *Work on these sheets. Answer completely, but be concise.*

Part 1: Multiple Choice. *Circle the letter corresponding to the best answer.*

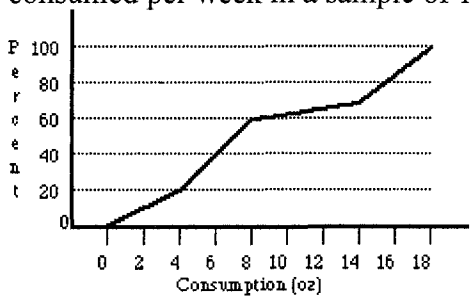
1. You measure the age, marital status and earned income of an SRS of 1463 women. The number and type of variables you have measured is
   (a) 1463; all quantitative.
   (b) four; two categorical and two quantitative.
   (c) four; one categorical and three quantitative.
   (d) three; two categorical and one quantitative.
   (e) three; one categorical and two quantitative.

2. Consumers' Union measured the gas mileage in miles per gallon of 38 1978–1979 model automobiles on a special test track. The pie chart below provides information about the country of manufacture of the model cars used by Consumers Union. Based on the pie chart, we may conclude that:
   (a) Japanese cars get significantly lower gas mileage than cars of other countries. This is because their slice of the pie is at the bottom of the chart.
   (b) U.S cars get significantly higher gas mileage than cars from other countries.
   (c) Swedish cars get gas mileages that are between those of Japanese and U.S. cars.
   (d) Mercedes, Audi, Porsche, and BMW represent approximately a quarter of the cars tested.
   (e) More than half of the cars in the study were from the United States.



3. A researcher reports that, on average, the participants in his study lost 10.4 pounds after two months on his new diet. A friend of yours comments that she tried the diet for two months and lost no weight, so clearly the report was a fraud. Which of the following statements is correct?
   (a) Your friend must not have followed the diet correctly, since she did not lose weight.
   (b) Since your friend did not lose weight, the report must not be correct.
   (c) The report only gives the average. This does not imply that all participants in the study lost 10.4 pounds or even that all lost weight. Your friend's experience does not necessarily contradict the study results.
   (d) In order for the study to be correct, we must now add your friend's results to those of the study and recompute the new average.
   (e) Your friend is an outlier.

4. The following is an ogive on the number of ounces of alcohol (one ounce is about 30 mL) consumed per week in a sample of 150 students.



A study wished to classify the students as "light", "moderate", "heavy" and "problem" drinkers by the amount consumed per week. About what percentage of students are moderate drinkers, that is consume between 4 and 8 ounces per week?

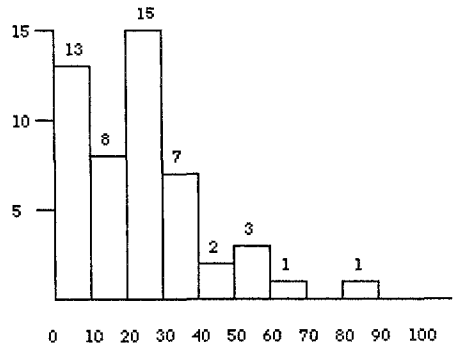
(a) 60%
(b) 20%
(c) 40%
(d) 80%
(e) 50%

5. "Normal" body temperature varies by time of day. A series of readings was taken of the body temperature of a subject. The mean reading was found to be 36.5° C with a standard deviation of 0.3° C. When converted to °F, the mean and standard deviation are
(°F = °C(1.8) + 32).

(a) 97.7, 32
(b) 97.7, 0.30
(c) 97.7, 0.54
(d) 97.7, 0.97
(e) 97.7, 1.80

6. The following is a histogram showing the actual frequency of the closing prices on the New York exchange of a particular stock. Based on the frequency histogram for New York Stock exchange, the class that contains the 80th percentile is:

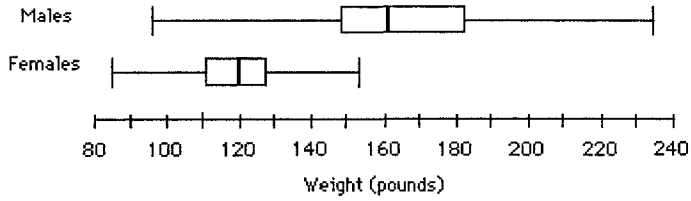
(a) 20-30
(b) 10-20
(c) 40-50
(d) 50-60
(e) 30-40



7. Which of the following is likely to have a mean that is smaller than the median?
   (a) The salaries of all National Football League players.
   (b) The scores of students (out of 100 points) on a very easy exam in which most get nearly perfect scores but a few do very poorly.
   (c) The prices of homes in a large city.
   (d) The scores of students (out of 100 points) on a very difficult exam in which most get poor scores but a few do very well.
   (e) Amounts awarded by civil court juries.

8. There are three children in a room, ages three, four, and five. If a four-year-old child enters the room the
   (a) mean age will stay the same but the variance will increase.
   (b) mean age will stay the same but the variance will decrease.
   (c) mean age and variance will stay the same.
   (d) mean age and variance will increase.
   (e) mean age and variance will decrease.

9. The weights of the male and female students in a class are summarized in the following boxplots:



   Which of the following is NOT correct?
   (a) About 50% of the male students have weights between 150 and 185 pounds.
   (b) About 25% of female students have weights more than 130 pounds.
   (c) The median weight of male students is about 162 pounds.
   (d) The mean weight of female students is about 120 pounds because of symmetry.
   (e) The male students have less variability than the female students.

10. When testing water for chemical impurities, results are often reported as bdl, that is, below detection limit. The following are the measurements of the amount of lead in a series of water samples taken from inner-city households (ppm).

    5, 7, 12, bdl, 10, 8, bdl, 20, 6

    Which of the following is correct?
    (a) The mean lead level in the water is about 10 ppm.
    (b) The mean lead level in the water is about 8 ppm.
    (c) The median lead level in the water is 7 ppm.
    (d) The median lead level in the water is 8 ppm.
    (e) Neither the mean nor the median can be computed because some values are unknown.

Part 2: Free Response

Communicate your thinking clearly and completely.

11. The test grades for a certain class were entered into a Minitab worksheet, and then "Descriptive Statistics" were requested. The results were:

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MTB > Describe 'Grades'.

                N     MEAN      MEDIAN    TRMEAN    STDEV    SEMEAN
Grades         28    74.71       76.00     75.50    12.61      2.38

                MIN      MAX       Q1        Q3
Grades        35.00    94.00    68.00     84.00
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You happened to see, on a scrap of paper, that the lowest grades were 35, 57, 59, 60, . . . but you don't know what the other individual grades are. Nevertheless, a knowledgeable user of statistics can tell a lot about the dataset simply by studying the set of descriptive statistics above.

(a) Write a brief description of what the results tell you about the distribution of grades. Be sure to address:

- the general shape of the distribution
- unusual features, including possible outliers
- the middle 50% of the data
- any significance in the difference between the mean and the median

(b) Construct a modified boxplot for these data.