**1. For a particular sample of 80 scores on a psychology exam, the following results were obtained:**  
  
First quartile = 59 Third quartile = 90 Standard deviation = 10  Range = 57  
Mean = 75   Median = 74   Mode = 41  Midrange = 69  
  
Answer each of the following:  
I.      What score was earned by more students than any other score? Why?   
II.     What was the highest score earned on the exam?   
III.    What was the lowest score earned on the exam?  
IV.     According to Chebyshev's Theorem, how many students scored between 55 and 95?  
V.      Assume that the distribution is normal.  Based on the Empirical Rule, how many students scored between 55 and 95?  
Please show all of your work.

**2. Find the range, standard deviation, and variance for the following sample data:**  
98, 2, 53, 61, 15, 87, 63, 63, 91, 29, 96, 79, 93, 40, 5, 62

**3. In terms of the mean and standard deviation:**  
  
        What does it mean to say that a particular value of x has a standard score of +1.8?   
  
          What does it mean to say that a particular value of x has a z-score of -2.6?

**4. A student scored 30 percent on a test, and was in the 24th percentile. Explain these two numbers.**

**5. An animal trainer obtained the following sample data (Table A) in a study of reaction times of dogs (in seconds) to a specific stimulus. He then selected another group of dogs that were much older than the first group and measured their reaction times to the same stimulus. The sample data is shown in Table B.**   
   
Table A                             Table B

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Classes | Frequency |  | Classes | Frequency |
| 2.3-2.9 | 25 | 2.3-2.9 | 5 |
| 3.0-3.6 | 4 | 3.0-3.6 | 4 |
| 3.7-4.3 | 13 | 3.7-4.3 | 40 |
| 4.4-5.0 | 14 | 4.4-5.0 | 39 |
| 5.1-5.7 | 5 | 5.1-5.7 | 5 |
| 5.8-6.4 | 31 | 5.8-6.4 | 5 |

   
**Find the variance and standard deviation for the two distributions above. Compare the variation of the data sets. Decide if one data set is more variable than the other.**

**6. In each of the four examples listed below, one of the given variables is independent (x) and one of the given variables is dependent (y).  Indicate in each case which variable is independent and which variable is dependent:**  
I. Rainfall; Crop yield  
II. Ability to concentrate; Level of fatigue  
III. Miles driven; Gas consumption  
IV. Average annual snowfall; Geographic location

**7. A sample of purchases at the local convenience store has resulted in the following sample data, where x = the number of items purchased per customer and f = the number of customers:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | 1 | 2 | 3 | 4 | 5 |
| f | 3 | 15 | 8 | 8 | 7 |

   
   
  
  
  
What does the 15 stand for in the above table?  
Find the midrange of items purchased.  
How many items were purchased by the customers in this sample?

**8. Suppose we have a set of blood pressures with a mean of 80 Diastolic, and a sample standard deviation of 5 points.  If we assume a normal distribution of Diastolic blood pressures, then between what two values can we be assured 99.7% of all Diastolic blood pressures will lie?**

**9. SAT I scores around the nation tend to have a mean scale score around 500, a standard deviation of about 100 points, and are approximately normally distributed. What SAT I score within the population would have a percentile rank of approximately 97.5?**  Show all work as to how this is obtained.