Statistics Quiz

1. What are the mean, mode, five-number summary, and standard deviation of the following set of values (you may use all the features of your calculator):

   3  4  5  5  5  6  6  7  9  9

2. Using the empirical rule, what percentage of values fall below 1 standard deviation above the mean?

3. In 2008, SAT math scores were normally distributed with a mean of 522 and a standard deviation of 102. Calculate the z-score for an SAT score of 700. What percentage of test takers do better than a 700 on the math portion?

4. The number of credits that college students take each semester is normally distributed with a standard deviation of 2. Given a sample of 100 college students with a mean of 12.4 credits, create a 95% confidence interval (α=.05) for the mean number of credits per college student per semester.

5. A drug company claims that their new pill will lower your cholesterol by at least 18 points. Using a sample of 50 individuals that used the drug, with a mean reduction of 17.2 points and a standard deviation of 3, perform a hypothesis test at a significance level of .05.
   
   a. What are your null and alternative hypotheses?

   b. What type of test is this (1 or 2 tailed)? What is your “critical” z-score?

   c. What is the calculated test statistic (z-score)?

   d. What is your conclusion?

   e. Based on the results from your sample, what type of error could have occurred in this test?

   f. Would you have made the same conclusion at significance level of .025?
Answer Key

1. Mean – 5.9; Mode – 5; Low – 3; Q1 – 5; Median – 5.5; Q3 – 7; Max – 9; Standard Deviation – 1.868

2. 84%

3. \( Z = 1.75; 4\% \)

4. 12.008 – 12.792

5a. \( H_0: \mu \geq 18; Ha: \mu < 18 \)

5b. 1-tailed; \( z = -1.645 \)

5c. \( z = -1.89 \)

5d. Reject the null hypothesis and the company’s claim

5e. Type I

5f. No, \( z = -1.96 \)