MAT156: Statistics
Chapter 6 Practice

Make sure you use the Tables in your book

Name: Key
Date: _____ Period: _____

For each problem (except #6), draw a diagram, label, and shade the appropriate region as we practiced in class in addition to providing an answer to the question. When using your calculator, please write down the calculation done. No work = No partial credit.

1. The Environmental Protection Agency (EPA) tested automobile fuel economy and found a mean of 24.8 miles per gallon (mpg) and a standard deviation of 6.2 mpg. Assume that the data was normally distributed.
   a. What is the probability that a randomly selected automobile will get more than 31 miles per gallon?

      0.1587

   b. What is the probability that a randomly selected automobile will get between 31 and 37 miles per gallon?

      0.1343

   c. What is the probability that a randomly selected automobile will get at most 27 miles per gallon?

      0.6368

   d. What kind of gas mileage do the worst 3% of automobiles get?

      13.1 mpg or less

2. Some IQ tests are standardized to follow a normal distribution with a mean of 100 and a standard deviation of 16.
   a. What range of scores would represent the *middle* 50% of IQ scores?

      89.3 - 110.7

   b. What percentage of people get an IQ score of at least 90?

      73.6%

3. Assume z is a standard normal random variable.
   a. Find the value of a given that $P(z < a) = 0.412$.

      $a = -0.22$

   b. Find the value of a given that $P(z > a) = 0.67$.

      $a = -0.44$

4. Assume z is a standard normal random variable.

a. Find $P(z > 1.5)$.

0.0668

b. Find $P(z < 2.25)$

0.9878

c. Find $P(-1 < z < 1.15)$.

0.7162

d. Find $P(1.2 < z < 1.8)$.

0.0792

5. Companies who design furniture for elementary school classrooms produce a variety of sizes for kids of different ages. Suppose the heights of kindergarten children can be described by a normal distribution with a mean of 38.2 inches and a standard deviation of 1.8 inches.

a. What is the probability that a randomly chosen kindergartener will be less than 3 feet tall?

0.1112

b. What height would represent the 80^{th} percentile for kindergarten heights?

39.7 inches

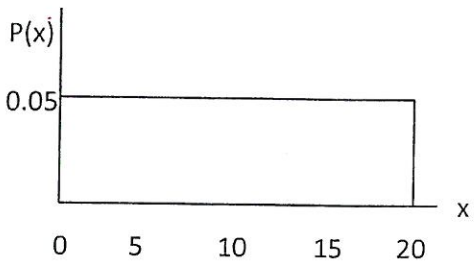
6. Use the following uniform distribution to find the requested probabilities.

a. $P(z < 4.3)$

0.215

b. $P(0.4 < z < 3.2)$

0.14



Extra Credit: While only 5% of babies have learned to walk by the age of 10 months, 75% are walking by 13 months of age. If the age at which babies develop the ability to walk can be described by a normal distribution, find the mean and standard deviation for the distribution.

$\mu = 12.1$

$\sigma = 1.3$