EE381 Homework #9

1) Find (a) the mean, (b) the standard deviation on an examination in which grades of 70 and 88 correspond to standard scores of -0.6 and 1.4, respectively.
2) Find the area under the normal curve between
   a) z = -1.20 and *z = 2.40*
   b) z = 1.23 and z = 1.87
   c) z = -2.35 and z = -0.50
3) Find the values of *z* such that:
   a) The area to the right of *z* is 0.2266
   b) The area to the left of *z* is 0.0314
   c) The area between -0.23 and *z* is 0.5722
   d) The area between -*z* and *z* is 0.9
4) If the diameters of ball bearings are normally distributed with mean 0.6140 inches and standard deviation 0.0025 inches, determine the percentage of ball bearings with diameters
   a) Between 0.610 and 0.618 inches
   b) Greater than 0.617 inches
   c) Less than 0.608 inches
   d) Equal to 0.615 inches
5) The mean grade on a final examination was 72, and standard deviation was 9. The top 10% of the students are to receive A's. What is the minimum grade a student must get in order to receive an A?
6) If 3% of the electric bulbs manufactured by a company are defective, find the probability that in a sample of 100 bulbs, (a) 0, (b) 5, (c) more than 5, (d) between 1 and 3, will be defective.
7) Show that the mean and variance of the uniform distribution are given respectively by
   a) $\mu = \frac{1}{2}(a + b)$
   b) $\sigma^2 = \frac{1}{12}(b - a)^2$
8) Let X be uniformly distributed in $-2 \leq x \leq 2$.
   Find
   a) $P(X < 1)$
   b) $P(|X - 1| \geq \frac{1}{2})$

Note: Your answers should show your step-by-step work. Answers which have only final results are not accepted.