Home Works for Chapter 8

Problem1. A random sample of size 100 is taken from an infinite population having a mean, 76 and a variance, 256. What is the probability that the sample mean will be between 75 and 78?

Problem2. A wire- bonding process is said to be in control if the mean pull-strength is 10 pounds. It is known that the pull-strength measurements are normally distributed with a standard deviation of 1.5 pounds. Periodic random samples of size 4 are taken from this process and the process is said to be "out of control" if a sample mean is less than 7.75 pounds. Comment (Hint: find the probability that the sample mean is less than 7.75, and then write your comment)

Problem3. The weights of ball bearings have a distribution with a mean of 22.40 ounces and a standard deviation of 0.048 ounces. If a random sample of size 49 is drawn from this population, find the probability that the
  a) Sample mean lies between 22.36 and 22.41
  b) Sample mean is more than 22.38,
  c) Sample mean is not more than 22.43,
  d) Sample mean is greater than or equal to 22.41.

Problem4. The distribution of heights of a certain breed of terrier dogs ha a mean of $\mu_1 = 72$ centimeters and a standard deviation of $\sigma_1 = 10$ centimeters, whereas the distribution of heights of a certain breed of poodles has a mean of $\mu_2 = 28$ centimeters with a standard deviation of $\sigma_2 = 5$ centimeters, if random samples of sizes $n_1 = 64$ terriers and $n_2 = 100$ poodles are selected, then:
  a) What is the sampling distribution for the difference $\overline{X}_1 - \overline{X}_2$
  b) Find the probability that the first sample mean will exceed the second sample mean by at most 44.2 centimeters?