1. A manufacturing survey reveals that an average worker produces an item in 75 seconds, with a standard deviation of 5 seconds.

    a. What is the probability that a worker chosen at random will take 80 or more seconds to make an item?

    b. What is the probability that it will take a worker chosen at random between 75 and 80 seconds?

    c. What is the probability that it will take 70 of fewer seconds?

2. Assume that for all Americans, IQ scores are normally distributed with a mean of 100 ($\mu = 100$) and a standard deviation of 15 ($\sigma = 15$).

          70   85   100   115   130
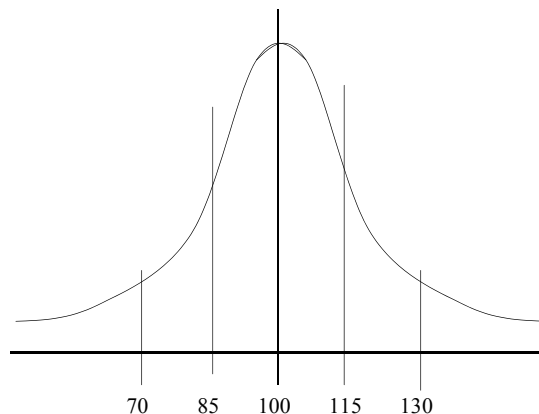
    a. What is the probability that a person selected at random will have an IQ below 90?

    b. What is the probability that a person selected at random will have an IQ between 90 and 120?

    c. What is the cutoff point for the top 5% of Americans? (In other words, what is the lowest IQ score someone can have and still be in the top 5%?)

3. You are an inspector for Coke. Your current job requires you to examine the volume of their 2-liter bottles. The standard deviation for Coke's 2-liter bottles is .05 liters. You take a random sample of 100 bottles and get a sample mean of 1.99 liters. What is the 90% confidence interval estimate of the true mean of all of Coke's 2-liter bottles?

4. The designers of an SAT math review course claim that their enrollees have higher SAT math scores than the average student accepted at Harvard. You randomly select 25 enrollees from and find, on average, their math SAT score is 2 points higher than the Harvard average. You know from previously collected data that the standard deviation for all enrollees is 10 points.

    a)   What is the 95% confidence interval of the enrollees' score (relative to Harvard's average)?

    b)   If Harvard's average math SAT score is 750, what is the 95% confidence interval of the enrollees' score?

    c)   What do you think of the SAT course designers' claim?

5. Nine months ago, the director of a local health clinic implemented a new prenatal outreach program designed to increase the number of prenatal clinic visits among pregnant women served by the clinic. Before the program, the average number of prenatal visits for women was 2.9. The director wants to evaluate the success of the new program, so she obtained data on 34 women who delivered babies in the most recent month. The distribution of number of visits for this group was:

# Prenatal Visits	% of women with # of visits
1	11.8%
2	11.8%
3	23.5%
4	29.4%
5	17.6%
6	5.9%

    a) Find the sample average and sample standard deviation of the number of visits for the 34 women.

    b) Find the 90% confidence interval for the mean number of visits for women under the new program. In one sentence, what does this interval mean? Find the 95% confidence interval.

    c) Based on your calculations above, is the program effective at increasing the number of visits? Explain.