The Data Hoard is at:

http://stat.pugetsound.edu/hoard/datasets.aspx

1. Use the penny masses data set (ID #9) from the Data Hoard for this problem. As always, be sure to read the description of the data set.

   (a) Compute the sample mean $m$ of the mass of these pennies.
   (b) Compute the sample standard deviation $s$ of the mass of these pennies.
   (c) Compute the five-number summary of the mass of these pennies.

In R Commander, all of these can be done with a single command.

2. Use the penny masses data set (ID #9) from the Data Hoard for this problem, and be sure that you have done Problem 1 before doing this problem.

   (a) Create a histogram of all the penny masses in this data set, with a reasonable bin width. (You may need to experiment a bit to find a reasonable bin width of course.)
   (b) Describe the shape of this histogram.
   (c) Explain the shape of this histogram by looking also at the other variable in the data set, the year of the penny. (For this, you should inspect the raw data itself.)
   (d) Using your results from Problem 1, note where the sample mean of these penny masses is on the $x$ axis of the histogram of penny masses.
   (e) Explain why the numerical summaries of penny masses computed in that problem are not particularly useful in computing what people would generally refer to as “the mass of a penny.”

3. Compute $z_{0.9}^*$, the central 0.9 quantile for the standard normal distribution, and state what you entered into the computer to do so.

4. Suppose that a random variable $X$ has a $N[22.9$ seconds, $3.8$ seconds] distribution. Compute

   $\text{Prob}(X \leq 28.3$ seconds$)$.

5. Suppose that a random variable $X$ has a $N[1.35$ cm, $0.2$ cm] distribution. Compute

   $\text{Prob}(X \geq 1.6$ cm$)$.

6. Suppose that a random variable $X$ has a $N[3$ m/s, $4$ m/s] distribution. Compute

   $\text{Prob}(X \leq -3$ m/s or $X \geq 9$ m/s$)$. 
7. (a) Compute $z_{0.75}$, the central 0.75-quantile for a standard normal distribution.

(b) Sketch a graph of the distribution $N[12$ meters, $4$ meters] and label the mean on the $x$ axis.
(c) Draw the standardized axis in this sketch just below the $x$ axis.
(d) Find the endpoints of the region under the graph of this distribution that has area 0.75 and is symmetric about the mean of the distribution. (This illustrates how, once a central quantile value is known, it can be rescaled to determine a central region with the same area under a non-standard normal distribution.)

8. Suppose that the heights of people in a certain population of 100,000 are approximately normally distributed with mean 64 inches and standard deviation 6 inches. Without using a computer (or table or calculator), find approximately how many people in this population are at least 52 inches tall.