Biostatistics Homework 7

1. Use Z table and find the values of $p = \Pr(Z > k)$
   (1) If $\Pr(Z > k) = 0.2$, k=?
   (2) If $\Pr(Z > k) = 0.1$, k=?
   (3) If $\Pr(Z > k) = 0.05$, k=?
   (4) If $\Pr(Z \le k) = 0.2$, k=?
   (5) If $\Pr(Z \le k) = 0.1$, k=?
   (6) If $\Pr(Z \le k) = 0.05$, k=?

2. Deer mice are small rodents native to North America. Their body lengths (excluding tail) are known to vary approximately Normally with mean $\mu = 86$ mm and standard deviation $\sigma = 8$ mm. Deer mice are found in diverse habitats and exhibit different adaptations to their environment. A random sample of 14 deer mice in a rich forest habitat gives an average body length of $\bar{x} = 91.1$ mm. Assume that the standard deviation σ of all deer mice in this area is also 8 mm.
   (a) What is the standard deviation of the mean length of $\bar{x}$?
   (b) What critical value do you need to use in order to compute a 95% confidence interval for the mean μ?
   (c) Give a 95% confidence interval for the mean body length of all deer mice in the forest habitat.

3. The 14 deer mice described in the previous exercise had average body length of $\bar{x} = 91.1$ mm. Assume that the standard deviation of body length in the population of all deer mice in the forest habitat is the same as the $\sigma = 8$ mm for the general deer mouse population.
   (a) Following your approach in the previous exercise, now give a 90% confidence interval for the mean body length of all deer mice in the forest habitat.
   (b) This confidence interval is shorter than your interval in the previous exercise, even though the intervals come from the same sample. Why does the second interval have a smaller margin of error?