PSYC 2317: Statistical Methods for Psychology

1. Suppose you have a collection of scores that is normally distributed with $\mu = 50$ and $\sigma = 18$, and suppose we draw samples of size $N = 36$.
   (a) What proportion of the samples will have means greater than 53?
   (b) What proportion of the samples will have means less than 44?
   (c) What is the probability that the sample will have a mean between 49 and 51?
2. For a normal population with $\mu = 200$ and $\sigma = 20$,
   (a) What is the probability of obtaining a sample mean greater than 210 for a sample of $N = 4$ scores?
   (b) What is the probability of obtaining a sample mean greater than 210 for a sample of $N = 16$ scores?
   (c) For a sample of $N = 25$ scores, what is the probability that the sample mean will be within 5 points of the population mean?
3. The population of IQ scores forms a normal distribution with a mean of $\mu = 100$ and a standard deviation of $\sigma = 15$. What is the probability of obtaining a sample mean greater than $\overline{X} = 97$,
   (a) for a random sample of $N = 9$ people?
   (b) for a random sample of $N = 25$ people?
4. At the end of the spring semester, the Dean of Students sent a survey to the entire freshman class. One question asked the students how much weight they had gained or lost since the beginning of the school year. The average was a gain of $\mu = 9$ pounds with a standard deviation of $\sigma = 6$ pounds. The distribution of scores was approximately normal. A sample of $N = 4$ students is selected and the average weight change is computed for the sample.
   (a) What is the probability that the sample mean will be greater than 10 pounds?
   (b) Of all of the possible samples, what proportion will *lose* weight?
   (c) What is the probability that the sample mean will be a gain of between 9 and 12 pounds?