1. We are interested in testing the following hypotheses about the average weight of students at a college:

   $H_0 : \mu = 68$

   $H_1 : \mu > 68$

   A SRS of n=36 students will be used and we will assume that σ is <u>known</u> to be 6 kg.

   a. Find α if we choose to reject *Ho* if we observe a sample with $\bar{y} > 69$.
   b. Find β if the true mean weight is 70.5 kg.
   c. Find the power to detect a true mean of 69.8 kg.
   d. Answer part (c) if we use a larger sample of *n*=64 students.

2. Blood pressure for American women aged 18-44 is approximately normal with a mean of 75 *mm Hg* and a standard deviation of 10 *mm Hg*. A sample of *n=25* women who jog at least 5 miles/week has a sample average blood pressure of 70.9 *mm Hg*.

   <u>The research question is</u>: Does the data provide strong evidence that the mean blood pressure for those who exercise regularly <u>is not equal to</u> 75 *mm Hg*?

   a. State the hypotheses (H_o and H_a) to be tested and find the p-value for these data.
   b. Write the rejection region (RR) in terms of z-scores and test H_o at the $\alpha = .03$ level.
   c. Write the RR for H_o in terms of $\bar{X}$.
   d. Find the probability of a Type II error if the true mean is 73 *mm Hg.*

3. Let Y be a random variable denoting the number of pips showing on a die that is tossed
   a. Find E(Y)
   b. Find Var(Y)
   c. Find E(3Y + 2)
   d. Find Var(3Y + 2)

4. Suppose that X is a random variable with E(X+4)=10 and $E[(X+4)^2]=116$
   a. Find Var(X+4)
   b. Find μ
   c. Find σ^2