6.2.1. State the decision rule that would be used to test the following hypotheses. Evaluate the appropriate test statistic and state your conclusion.

(a) $H_0: \mu = 120$ versus $H_1: \mu < 120; \bar{y} = 114.2, n = 25, \sigma = 18, \alpha = 0.08$

(b) $H_0: \mu = 42.9$ versus $H_1: \mu \neq 42.9; \bar{y} = 45.1, n = 16, \sigma = 3.2, \alpha = 0.01$

(c) $H_0: \mu = 14.2$ versus $H_1: \mu > 14.2; \bar{y} = 15.8, n = 9, \sigma = 4.1, \alpha = 0.13$

6.2.3. (a) Suppose H_0: $\mu = \mu_0$ is rejected in favor of H_1: $\mu \neq \mu_0$ at the $\alpha = 0.05$ level of significance. Would H_0 necessarily be rejected at the $\alpha = 0.01$ level of significance?

(b) Suppose H_0: $\mu = \mu_0$ is rejected in favor of H_1: $\mu \neq \mu_0$ at the $\alpha = 0.01$ level of significance. Would H_0 necessarily be rejected at the $\alpha = 0.05$ level of significance?

6.3.4. Suppose H_0: $p = 0.45$ is to be tested against H_1: $p > 0.45$ at the $\alpha = 0.14$ level of significance, where $p = P$(ith trial ends in success). If the sample size is two hundred, what is the smallest number of successes that will cause H_0 to be rejected?

6.4.5. If $H_0: \mu = 240$ is tested against $H_1: \mu < 240$ at the $\alpha = 0.01$ level of significance with a random sample of twenty-five normally distributed observations, what proportion of the time will the procedure fail to recognize that μ has dropped to two hundred twenty? Assume that $\sigma = 50$.

6.4.7. If H_0: $\mu = 200$ is to be tested against H_1: $\mu < 200$ at the $\alpha = 0.10$ level of significance based on a random sample of size n from a normal distribution where $\sigma = 15.0$, what is the smallest value for n that will make the power equal to at least 0.75 when $\mu = 197$?