Stat 171 - Worksheet for Section 7.5

Name: _____

1. Find the critical value χ_0^2 for a right-tailed test when $n = 18$ and $\alpha = 0.01$.
   (a) Identify the degrees of freedom and the level of significance.
   (b) Use table 6 in appendix B to find χ_0^2.

2. Find the critical values χ_L^2 and χ_R^2 for a two-tailed test when $n = 18$ and $\alpha = 0.01$.
   (a) Identify the degrees of freedom and the level of significance.
   (b) Use table 6 in appendix B to find χ_R^2 for the area $\frac{1}{2}\alpha$.
   (c) Use table 6 in appendix B to find χ_L^2 for the area $1 - \frac{1}{2}\alpha$.

3. A bottling company claims that the variance of the amount of sports drink in a 12-ounce bottle is no more than 0.40. A random sample of 31 bottles has a variance of 0.75. At $\alpha = 0.01$, is there enough evidence to reject the company's claim? Assume the population is normally distributed.
   (a) Identify the claim and state H_0 and H_a.

   (b) Identify the level of significance α, and the degrees of freedom.

   (c) Find the critical value χ_0^2 and identify the rejection region.

   (d) Find the standardized test statistic χ^2.

(e) Decide whether to reject the null hypothesis. Sketch a graph.

(f) Interpret the decision in the context of the original claim.

4. A Police chief claims that the standard deviation of the lengths of response times is 3.7 minutes. A random sample of 9 response times has a standard deviation of 3.0 minutes. At $\alpha = 0.05$, is there enough evidence to support the police chief's claim? Assume the population is normally distributed.