CHI-SQUARED DISTRIBUTION

TEXT: 11.1, 11.6

LAST NAME	FIRST NAME	DATE

1 (6 points)**.** For each question, find the required critical value(s) of the χ^2 distribution, make a sketch of the pdf, label the critical value(s) on the sketch, and shade the corresponding area under the curve.

(a) χ^2 with 19 degrees of freedom, area in the left tail is 0.05.

(b) χ^2 with 39 degrees of freedom, area in the right tail is 0.02.

(c) χ^2 with 16 degrees of freedom, area of 0.05 split equally among the two tails.

2 (3 points)**.** Find the area under the curve of χ^2 distribution

(a) with 30 degrees of freedom, to the left of $x = 20$.

(b) with 2 degrees of freedom, to the right of $x = 6$.

(c) with 17 degrees of freedom, between $x_1 = 3$ and $x_2 = 10$.

3 (6 points)**.** A manufacturer claims that the average thickness of the spearmint gum it produces is 7.5 one-hundredths of an inch, with standard deviation of 0.1. A quality control team regularly checks this claim. On one production run, they took a random sample of $n = 70$ pieces of gum and measured their thickness, producing the following sample statistics: $\overline{x} = 7.55$ and $s = 0.13$ one-hundredths of an inch. Test the manufacturer's claim about the population standard deviation with $\alpha = 0.05$.

(a) H_0 : H_1 :

(b) State the distribution of the test statistic:

(c) Sketch a graph of the distribution of the test statistic, find and label the critical value(s), shade the rejection region.

(d) Compute the test statistic and sketch it on the graph above.

(e) Find the p-value of the test.

(f) State the conclusion.