

Name:

Statistics

Date:

Practice Quiz 8-D

1. State the critical value(s) for the following χ^2 tests of a single variance with a sample size of 20.

a) right-tailed

For $df =$ _____ in the _____ column, $\chi^2_{\alpha} =$ _____.

b) left-tailed

For $df =$ _____ in the _____ column, $\chi^2_{\alpha} =$ _____.

c) two-tailed

For $df =$ _____, in the _____ column, $\chi^2_{\alpha/2} =$ _____, and in the _____ column, $\chi^2_{\alpha/2} =$ _____.

2. Peimani Farms has a new automatic loader that may be more or less consistent than the old one. Previously, the average wheat shipment was 800 kg, with standard deviation 15.5 kg. A random sample of shipments with the new loader has the following weights, in kg: 802, 811, 797, 788, 786, 810, 804, 790, 794, and 804, and 799.

a) How many degrees of freedom are there?

$df =$ _____ - 1 = _____

b) What are the critical values for a two-tailed χ^2 test?

For $df =$ _____, in the _____ column, $\chi^2_{\alpha/2} =$ _____, and in the _____ column, $\chi^2_{\alpha/2} =$ _____.

c) Sketch the χ^2 curve, label the peak of the curve and the critical value, and shade the critical region.

All χ^2 curves start at $\chi^2 =$ _____, because squares cannot be negative.

The peak of a χ^2 curve is $df - 2$, which in this case is $\chi^2 =$ _____.

χ^2 curves are skewed _____.

Sketch

d) Calculate χ^2 for the standard deviation, and mark it on the curve.

The population variance being tested is $\sigma^2 =$ _____ $^2 =$ _____.

The calculated sample variance is $s^2 =$ _____ $^2 =$ _____.

There are _____ degrees of freedom.

$\chi^2 =$ _____ (_____) = _____

e) Are the data statistically significant?

_____, because the calculated value of χ^2 is _____ than _____.

f) State the conclusion, followed by $\chi^2(df)$ and a range for p .

The standard deviation of shipment weights with the new loader is _____ than 15.5 kg, $\chi^2(\text{_____}) =$ _____, p _____ .05.

g) What would the conclusion have been if the answer to (d) had been $\chi^2 = 24.04$?

The standard deviation of shipment weights with the new loader is _____ than 15.5 kg, $\chi^2(\text{_____}) =$ _____, p _____ .05.

h) What would the conclusion have been if the answer to (d) had been $\chi^2 = 14.04$?

_____, $\chi^2(\text{_____}) =$ _____, p _____ .05.