

Statistics Quiz 7.4-7.5 Homework Review

Name _____ Date _____ Period _____

Find the critical value or values of χ^2 based on the given information.

1. $H: \sigma = 8.0, n = 10, \alpha = 0.01$
2. $H_1: \sigma > 3.5, n = 14, \alpha = 0.05$
3. $H_1: \sigma < 0.14, n = 23, \alpha = 0.10$
4. $H_1: \sigma > 26.1, n = 9, \alpha = 0.01$
5. $H_1: \sigma < 0.629, n = 19, \alpha = 0.025$
6. $H_1: \sigma \neq 9.3, n = 28, \alpha = 0.05$

Use the traditional method to test the given hypothesis. Assume that the population is normally distributed and that the sample has been randomly selected.

7. A machine dispenses a liquid drug into bottles in such a way that the standard deviation of the contents is 81 milliliters. A new machine is tested on a sample of 24 containers and the standard deviation for this sample group is found to be 26 milliliters. At the 0.05 level of significance, test the claim that the amounts dispensed by the new machine have a smaller standard deviation.
8. When 12 bolts are tested for hardness, their indexes have a standard deviation of 41.7. Test the claim that the standard deviation of the hardness indexes for all such bolts is greater than 30.0. Use a 0.025 level of significance.
9. At the $\alpha = 0.05$ significance level test the claim that a population has a standard deviation of 20.3. A random sample of 18 people yields a standard deviation of 27.1.
10. The standard deviation of math test scores at one high school is 16.1. A teacher claims that the standard deviation of the girls' test scores is smaller than 16.1. A random sample of 22 girls results in scores with a standard deviation of 12.9. Use a significance level of 0.01 to test the teacher's claim.

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11. A manufacturer uses a new production method to produce steel rods. A random sample of 17 steel rods resulted in lengths with a standard deviation of 4.7 cm. At the 0.10 significance level, test the claim that the new production method has lengths with a standard deviation different from 3.5 cm, which was the standard deviation for the old method.
12. With individual lines at the checkouts, a store manager finds that the standard deviation for the waiting times on Monday mornings is 5.7 minutes. After switching to a single waiting line, he finds that for a random sample of 29 customers, the waiting times have a standard deviation of 4.9 minutes. Use a 0.025 significance level to test the claim that with a single line, waiting times vary less than with individual lines.
13. Systolic blood pressure levels for men have a standard deviation of 19.7 mm Hg. A random sample of 31 women resulted in blood pressure levels with a standard deviation of 22.3 mm Hg. Use a 0.05 significance level to test the claim that blood pressure levels for women have the same variation as those for men.
14. In one town, monthly incomes for men with college degrees are found to have a standard deviation of \$650. Use a 0.01 significance level to test the claim that for men without college degrees in that town, incomes have a higher standard deviation. A random sample of 22 men without college degrees resulted in incomes with a standard deviation of \$913.
15. For randomly selected adults, IQ scores are normally distributed with a standard deviation of 15. The scores of 14 randomly selected college students are listed below. Use a 0.10 significance level to test the claim that the standard deviation of IQ scores of college students is less than 15. Round the sample standard deviation to three decimal places.

115 128 107 109 116 124 135

127 115 104 118 126 129 133

16. Heights of men aged 25 to 34 have a standard deviation of 2.9. Use a 0.05 significance level to test the claim that the heights of women aged 25 to 34 have a different standard deviation. The heights (in inches) of 16 randomly selected women aged 25 to 34 are listed below. Round the sample standard deviation to five decimal places.

62.13 65.09 64.18 66.72 63.09 61.15 67.50 64.65

63.80 64.21 60.17 68.28 66.49 62.10 65.73 64.72