Antelope Valley College



Math 115 Final Review

Name: Date:

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| 1. | An article by D. Schaefer et al. reported on a long term study of the effects of hurricanes on tropical streams of the Luquillo Experimental Forest in Puerto Rico. The study shows that Hurricane Hugo had a significant impact on stream water chemistry. The following table shows a sample of 11 ammonia fluxes in the first year after Hugo. Data are in kilogram   1. Determine the mean 2. Determine the sample standard deviation 3. Determine the range |

|  |  |  |  |
| --- | --- | --- | --- |
| 94 | 65 | 144 | 180 |
| 115 | 55 | 154 | 88 |
| 40 |  |  |  |

1. In an article “Grandchildren Raised by Grandparents, a Troubled Trend”, M. Blackburn considered the rates of children (under 18 years of age) living in California with grandparents as their primary caretakers. A sample of 15 California counties yielded the following percentages of children under 18 living with grandparents.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 5.5 | 4.2 | 5.7 | 5 | 2.3 | 4.4 | 6.7 | 6 |
| 4.4 | 5.8 | 5.1 | 6.1 | 4.4 | 4.9 | 4.8 |  |

* 1. Obtain and interpret the quartiles
  2. Determine and interpret the interquartile range
  3. Find and interpret the *five-number summary*
  4. Identify potential outliers, if any

|  |  |
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| 3. | A student takes a multiple choice exam with 10 questions, each with a five possible selections for answer. A passing grade is 70% or better. Suppose that the student was unable to find time to study for the exam and just guesses at each question. Find the probability that the student  10   1. Get at least one question correct. 1       10   1. Get 5 correct 5        1. Passes the class. |

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| 4. | A study by M. Chen et al, assessed fatigue in steel-plant workers due to heat stress. A random sample of 29 casting workers had a mean post-work heart rate 77.5 beats per minute (bpm). At the 5% significance level, do the data provide sufficient evidence to conclude that the mean post-work heart rate for casting workers exceeds the normal resting heart rate of 71 bpm? Assume that the population standard deviation is 12.4 bpm.   1. What is the confidence level 2. What is the null hypothesis 3. What is the test statistic 4. What is the critical value 5. What is the conclusion |

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| 5. |     *x*  5.5 *x*  5.8 *x*  6.3 *s* 2  1.2 *s* 2  1.01 *s* 2  1.6 , *n*  3 *k*  3  1 2 3 1 2 3   1. Determine the variance within samples 2. What is the numerator degree of freedom 3. What is the denominator degree of freedom 4. Calculate the variance between samples 5. Calculate the F statistic |

6. Using the results from problem 5, decide at the 10% significant level and the 5% significance level whether the data provide sufficient evidence to conclude that the mean population from which the samples were drawn are not all the same. The degree of freedom, *df* = (*k* – 1, k(*n –1)* and a snapshot of an *F-Distribution* table is provided below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | dfn | | | | |
|  | dfd/α | 1 | 2 | 3 | 4 | 5 |
| 6 | 0.1 | 3.78 | 3.46 | 3.29 | 3.18 | 3.11 |
| 0.05 | 5.99 | 5.14 | 4.76 | 4.53 | 4.39 |
| 0.025 | 8.81 | 7.26 | 6.6 | 6.23 | 5.99 |
| 0.01 | 13.75 | 10.92 | 9.78 | 9.15 | 8.75 |
| 0.005 | 18.63 | 14.54 | 12.92 | 12.03 | 11.46 |
|  |  |  |  |  |  |  |
| 7 | 0.1 | 3.59 | 3.26 | 3.07 | 2.96 | 2.88 |
| 0.05 | 5.59 | 4.74 | 4.35 | 4.12 | 3.97 |
| 0.025 | 8.07 | 6.54 | 5.89 | 5.52 | 5.29 |
| 0.01 | 12.25 | 9.55 | 8.45 | 7.85 | 7.46 |
| 0.005 | 16.24 | 12.4 | 10.88 | 10.05 | 9.52 |