## Review for Chapter 6 Test

COLLECTED ON TEST DAY

Name HACHER

Solve each problem. Show your work, especially your set-ups. If you use a graphing calculator function, state which one.

- 1) Given the same sample statistics, which level of confidence will produce the narrowest confidence interval?

  A) 85%

  B) 90%

  C) 75%

  D) 95%
- 2) Find the critical value  $z_c$  that corresponds to a 95% confidence level.

±1.96

3) A random sample of 150 students has a grade point average with a standard deviation of 0.78. Find the margin of error if c = 0.98 and the sample mean is 75.

2.33 (.78)=

4) A random sample of 40 students has a mean annual earnings of \$3120 and a standard deviation of \$677. Construct the confidence interval for the population mean,  $\mu$  if c = 0.95.

(\$2910, \$3330)

 $E = 1.96 \left( \frac{671}{\sqrt{40}} \right) = \pm 210$ 

- 5) In a recent study of 84 eighth graders, the mean number of hours per week that they watched television was 23.5 with a standard deviation of 6.2 hours.
  - a) Find the 95% confidence interval of the mean.

1.96 (6.2) =1,32

(22.18, 24.83)

b) If the standard deviation is doubled to 12.4, what will be the effect on the confidence interval?

Widen the interval

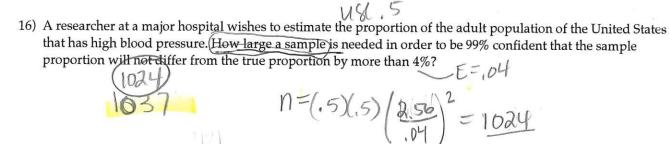
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| 6)     | In order to set rates, an insurance company is trying to estimate the number of sick days that full time workers at an auto repair shop take per year. A previous study indicated that the standard deviation was 2.8 days. How large a sample must be selected if the company wants to be 95% confident that the true mean differs from the sample mean by no more than 1 day? |           |           |           |           |                                     |         |          |           |               |                |        |  |
|--------|---|-----------|-----------|-----------|-----------|-------------------------------------|---------|----------|-----------|---------------|----------------|--------|--|
|        | sample  | mean by   | y no mo   | re than 1 | l day?    | $\gamma = \left(\frac{2}{3}\right)$ | ES)     | 2 1.96   |           |               |                |        |  |
|        |   | 01        |           |           |           | -                                   |         |          |           | Round         |                |        |  |
| 7)     | 7) The numbers of advertisements seen or heard in one week for 30 randomly selected people in the United States are listed below. Construct a 98% confidence interval for the true mean number of advertisements.   |           |           |           |           |                                     |         |          |           | ates          |                |        |  |
|        | 598   | 494       | 441       | 595       | 728       | 690                                 | 684     | 486      | 735       | 808           |                |        |  |
| /.     | 481   | 298       | 135       | 846       | 764       | 317                                 | 649     | 732      | 582       | 677           |                |        |  |
|        | 734   | 588       | 590       | 540       | 673       | 727                                 | 545     | 486      | 702       | 703           |                |        |  |
|        | your sample mean = $\frac{3.03}{9.53}$ your sample standard deviation = $\frac{159.53}{159.53}$   |           |           |           |           |                                     |         |          |           |               |                |        |  |
|        | 603 tc=2.462  |           |           |           |           |                                     |         |          |           |               | -              |        |  |
|        | your confidence interval $\underbrace{\xi}_{\underline{t}}$   |           |           |           |           |                                     |         |          |           |               | 1.7            |        |  |
|        | your confidence interval $\frac{138}{529.2,672.64}$ $\frac{159.53}{120}$ $\frac{159.53}{120}$ $\frac{159.53}{120}$  |           |           |           |           |                                     |         |          |           |               |                |        |  |
|        |   |           |           | 7         |           |                                     |         |          |           | <i>z L.</i> ( | J30            |        |  |
| 8)     | 8) Find the critical value, $t_c$ for $c = 0.99$ and $n = 10$ .   |           |           |           |           |                                     |         |          |           |               |                |        |  |
|        | chart 3,250   |           |           |           |           |                                     |         |          |           |               |                |        |  |
| tchart |   |           |           |           |           |                                     |         |          |           |               |                |        |  |
| 9)     | Find th   | e value o | of E, the | margin    | of error, | for $c = 0$                         | .90, n= | 16 and s | = 2.3, if | the samp      | le mean is 10. |        |  |
|        | 18  |           |           |           | E=1       | .018                                |         | t        | C (SD)    | =£<br>→>      | 1.75 (2.3)     | -1,006 |  |
| (0)    | In a random sample of 35 families, the average weekly food expense was \$95.60 with a standard deviation of   |           |           |           |           |                                     |         |          |           |               |                |        |  |

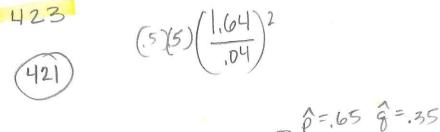
\$22.50. Determine whether a normal distribution or a t-distribution should be used or whether neither of these can be used to construct a confidence interval. Assume the distribution of weekly food expenses is normally

C) Neither a normal distribution nor a t-distribution can be used.

| (11) Construct a 95% confidence interval for the population mean, μ. Assume the population has a norm distribution. A random sample of 16 fluorescent light bulbs has a mean life of 645 hours with a stan   | nal dard                |
|--|-------------------------|
| deviation of 31 hours.   |                         |
| $E = 2.13 \left(\frac{31}{\sqrt{16}}\right) = 1$   | 6,51 \ 645              |
| 12) The grade point averages for 10 randomly selected high school students are listed below. Assume the point averages are normally distributed.   | ne grade                |
| 2.0 3.2 1.8 2.9 0.9 4.0 3.3 2.9 3.6 0.8 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \  | usct                    |
| your sample mean = SWC 7.54 ACMC your sample standard deviation = 111  | + 234                   |
| your sample mean = $100 \text{ N}^{-1}$ your sample standard deviation = $1111$<br>your confidence interval $1.55 353$ $= 2.82 \left(\frac{1.11}{\sqrt{10}}\right) =$  | ,99 - 32.54             |
| $2.064\left(\frac{17}{525}\right) = 7.6$   | 02                      |
| 13) A manufacturer receives an order for fluorescent light bulbs. The order requires that the bulbs have span of 750 hours. The manufacturer selects a random sample of 25 fluorescent light bulbs and find have a mean life span of 740 hours with a standard deviation of 17 hours. Test to see if the manufacturer making acceptable light bulbs. Use a 95% confidence level. Assume the data are normally distributed. | s that they<br>turer is |
| 1.02 (738.847579) chetalus 700 000000000000000000000000000000000   | from 740                |
| 14) A survey of 400 non-fatal accidents showed that 152 involved the use of a cell phone. Find a point of p, the population proportion of non-fatal accidents that involved the use of a cell phone.   | /<br>estimate for       |
| $p = 6380$ $p = \frac{152}{400}$   |                         |
| 15) When 415 college students were surveyed, 175 said they own their car. Construct a 95% confidence the proportion of college students who say they own their cars.   | interval for            |
| P for mulas + 2  | = +.42                  |
| (E= 1.96/642(.56) =  | 047                     |



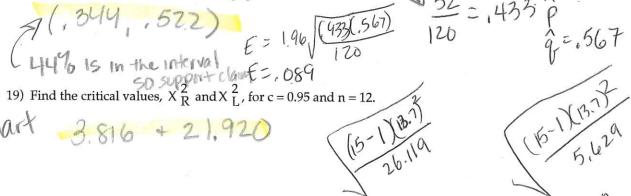
- 17) A state highway patrol official wishes to estimate the number of drivers that exceed the speed limit traveling a certain road.
  - a) How large a sample is needed in order to be 90% confident that the sample proportion will not differ from the true proportion by more than 4%?



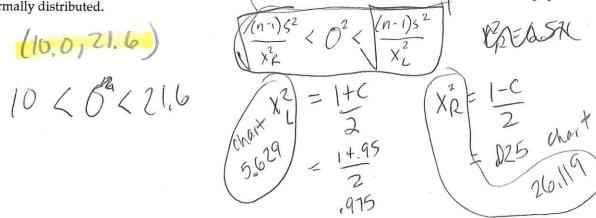
b) Repeat part (a) assuming previous studies found that 65% of drivers on this road exceeded the speed limit.

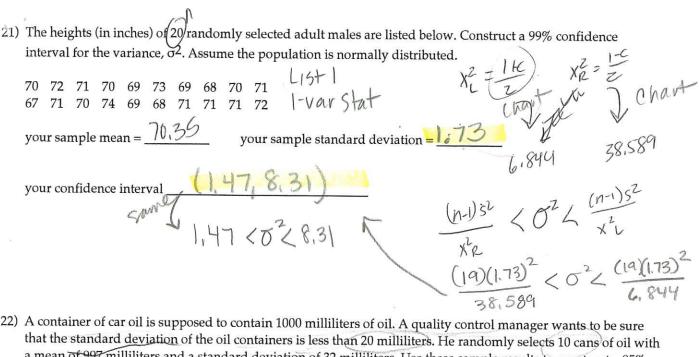


18) The USA Today claims that 44% of adults who access the Internet read the international news online. You want to check the accuracy of their claim by surveying a random sample of 120 adults who access the Internet and asking them if they read the international news online. Fifty-two adults responded "yes." Use a 95% 196 confidence interval to test the newspaper's claim.



20) Construct a 95% confidence interval for the population standard deviation σ of a random sample of 15 men who have a mean weight of 165.2 pounds with a standard deviation of 13.7 pounds. Assume the population is normally distributed.





22) A container of car oil is supposed to contain 1000 milliliters of oil. A quality control manager wants to be sure a mean of 997 milliliters and a standard deviation of 32 milliliters. Use these sample results to construct a 95% confidence interval for the true value of o Does this confidence interval suggest that the variation in the oil

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