

|                       |              |
|-----------------------|--------------|
| Elementary Statistics | Name: _____  |
| Study Guide 22        | Class: _____ |
| Due Date: _____       | Score: _____ |

**Your solutions must be consistent with class notes & resources.**

Be Neat, Organized, and No Work  $\Leftrightarrow$  No Points

1. (4 points) Complete the following chart for whenever constructing the confidence interval for population mean.

What TI commands do you use to find the C.V. and Confidence Interval?

| Be Very Specific    | $\sigma$<br>Known | $\sigma$<br>Unknown |
|---------------------|-------------------|---------------------|
| Critical Value      |                   |                     |
| Confidence Interval |                   |                     |

2. (3 points) Find the critical value  $t_{\alpha/2}$  for 98% confidence interval for the population mean with  $n = 20$ . Drawing, Labeling, Shading, and TI Command Required.

2. \_\_\_\_\_

3. (3 points) Find the critical value  $t_{\alpha/2}$  for 90% confidence interval for the population mean with  $n = 15$ . Drawing, Labeling, Shading, and TI Command Required.

3. \_\_\_\_\_

4. (2 points) Consider the confidence interval  $72.8 < \mu < 86.4$ , find the sample mean  $\bar{x}$  and its margin of error.

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4. \_\_\_\_\_

5. (3 points) Given  $n = 65$ ,  $\bar{x} = 145$ , and  $\sigma = 12.5$ , find 98% confidence interval to estimate population mean and the margin of error. Full TI command required.

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5. \_\_\_\_\_

6. (3 points) Given  $n = 15$ ,  $\bar{x} = 78$ , and  $s = 7.5$ , find 90% confidence interval to estimate population mean and the margin of error. Full TI command required.

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6. \_\_\_\_\_

7. (3 points) The mean age of 50 randomly selected teachers in southern California was 42.5. If it is known from other studies that the standard deviation of ages of all teachers is 8.75, find the 99% confidence interval for the mean age of all teachers in southern California and its margin of error. Full TI command required.

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7. \_\_\_\_\_

8. (2 points) What formula do we use to determine the minimum sample size needed to construct confidence interval for population mean?

| When  | $\sigma$ known | $\sigma$ Unknown |
|-------|----------------|------------------|
| $n =$ |                |                  |

9. (3 points) Find the minimum sample size needed when estimating population mean with 96% confidence level, margin of error to be within 10 and  $\sigma = 7.5$ . Drawing with full TI command required.

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9. \_\_\_\_\_

10. (3 points) Find the minimum sample size needed when estimating population mean with 92% confidence level, margin of error to be within 2.5 and  $s = 20$ . Drawing with full TI command required.

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10. \_\_\_\_\_

11. (3 points) Find the minimum sample size needed when estimating population mean with 99% confidence level, margin of error to be within 5 and  $s = 32$ . Drawing with full TI command required.

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11. \_\_\_\_\_

12. The mean age of 25 randomly selected lawyers was 47.5 years with the standard deviation of 6.5 years,

- (a) (2 points) Find the 92% confidence interval for the mean age of all lawyers. Full TI command required.

(a) \_\_\_\_\_

- (b) (3 points) Find the minimum sample size needed if we wish to construct the confidence interval with error to be within 5 years of the true mean age of all lawyers. Assume that  $\sigma = 7.2$  years. Drawing with full TI command required.

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(b) \_\_\_\_\_

13. It has been reported that the standard deviation of all math exams at the college is 7.5,

(a) (2 points) Find the critical value for 85% confidence interval for the mean of all exams. Drawing & Shading with Full TI Command Required.

(a) \_\_\_\_\_

(b) (3 points) Find the minimum sample size needed if we wish to be 85% confident and error to be within 2.5 points of the true mean score of all exams.

(b) \_\_\_\_\_

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14. Thirty workers were randomly surveyed about how long it takes them to travel to work each day. The data below are given in minutes:

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 20 | 35 | 42 | 52 | 65 | 20 | 60 | 49 | 24 | 37 | 23 | 24 | 35 | 59 | 62 |
| 41 | 25 | 28 | 27 | 50 | 47 | 58 | 30 | 32 | 48 | 40 | 45 | 39 | 55 | 50 |

(a) (2 points) Find the sample mean and sample standard deviation for this survey. Round your answer to a whole number.

(a) \_\_\_\_\_

(b) (3 points) Draw its box plot and clearly label it.

(c) (3 points) Use the rounded answers from above to construct the confidence interval for the mean time of getting to work for all workers. Full TI command required.

(c) \_\_\_\_\_

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*Class participation will benefit all of us.*