

# Disclaimer

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# **Chapter 7 Homework**

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## Chapter 7 Homework

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1. True or False. Point estimates are derived from sample data.
2. Fill in the blank. Error, also known as margin of error, is the distance between the point \_\_\_\_\_ and the population \_\_\_\_\_.
3. True or False. The sample mean is used to estimate the population mean ( $\mu$ ), the sample standard deviation is used to estimate the population standard deviation ( $\sigma$ ) and the sample proportion is used to estimate the population proportion ( $p$ ).
4. True or False. The width of a confidence interval increases as the confidence level decreases.
5. True or False. Margin of error will decrease as  $n$ , the sample size, decreases.
6. True or False. To be highly confident and have a narrower (tighter) confidence interval, increase  $n$ .
7. Construct a 95% confidence interval for the population mean given the following: sample mean = 5500, population standard deviation = 100 and sample size = 1000.
8. Construct a 90% confidence interval for the population mean given the following: sample mean = 33, population standard deviation = 5 and sample size = 36.
9. A confidence interval resulted in the following:  $22 \pm 0.7$ . What is the point estimate?
10. A confidence interval resulted in the following:  $121 \pm 16.4$ . What is the margin of error?
11. A confidence interval resulted in the following:  $99 \pm 25$ . What is the margin of error?
12. What common confidence level was most likely used to create the confidence interval (26, 34) given  $n = 36$  and  $\sigma = 12$ ?



13. What common confidence level was most likely used to create the confidence interval (41, 49) given  $n = 49$  and  $\sigma = 14$ ?
14. For a situation that follows a t-distribution, what would be the degrees of freedom for the following sample sizes?
  - a)  $n = 20$
  - b)  $n = 12$
  - c)  $n = 6$
15. What would be the t critical value used to construct
  - a) a 99% confidence interval given  $n = 15$ ?
  - b) a 95% confidence interval given  $n = 3$ ?
  - c) a 90% confidence interval given  $n = 17$ ?
16. Construct a 90% confidence interval for the population mean given the following: sample mean = 27, sample standard deviation = 0.4 and sample size = 25. Assume the sample was taken from a normal population.
17. Construct a 99% confidence interval for the population mean given the following: sample mean = 175, sample standard deviation = 11 and sample size = 9. Assume the sample was taken from a normal population.
18. What is the standard error of the proportion given  $p = 0.44$  and  $n = 64$ ?
19. What is the standard error of the proportion given  $p = 0.61$  and  $n = 100$ ?
20. Construct a 99% confidence interval for the population proportion given the following:  $x = 23$  and sample size = 59.
21. Construct a 90% confidence interval for the population proportion given the following:  $x = 181$  and sample size = 335.
22. What minimum sample size is needed to estimate the population mean to within 7 units with 99% confidence given the population standard deviation = 44?
23. What minimum sample size is needed to estimate the population mean to within 19 units with 90%



confidence given the population standard deviation = 50?

24. What minimum sample size is needed to estimate the population proportion to within 2.2% with 99%?
25. True or False. To determine the minimum sample size needed to estimate a population proportion, use 0.50 as a conservative estimate for the sample proportion if a sample estimate from a previous study is unknown.



## Answers

1. True
2. Estimate, parameter
3. True
4. False
5. False
6. True
7. (5493.8, 5506.2)
8. (31.6, 34.4)
9. 22
10. 16.4
11. 25
12. 95%
13. 95%
14. a) 19, b) 11, c) 5
15. a) 2.97684, b) 4.30265, c) 1.745884
16. (26.9, 27.1)
17. (162.7, 187.3)
18. 0.062
19. 0.049
20. (0.226, 0.553)
21. (0.496, 0.585)
22. 262
23. 19
24. 3425
25. True

