

1. Degrees of freedom equals the number of ___ minus the number of _____
2. A _____ sample is when we take every n^{th} element in the population (5^{th} , 10^{th} , etc.)
3. The mean of a sample is expected to be _____ (larger than, smaller than, equal to) the mean of the population.
4. The standard error is the _____ divided by the _____
5. "Random" in the phrase "random sample" means that each observation is:
6. What is the difference between the normal and t distributions? (Why can't we just have one?)
7. Infinity starts (in statistics) approximately at the number _____
8. A _____ sample would occur when a store employee decides accept or reject a shipment of oranges by looking only at the ones on the top of the boxes.
9. What is the purpose of a confidence interval?
10. We use the t distribution when the number of _____ is _____ (larger than /smaller than /equal to)
11. What's the relationship between a confidence interval and a hypothesis test?
12. We reject a hypothesis when the _____ is _____ (larger than /smaller than /equal to)

13. A correlation coefficient of -0.9 means that there is a _____ (direct/inverse/can't tell) relationship, which is _____ (weak/strong/can't tell).
14. The correlation coefficient must be between _____ and _____
15. What do we mean when we say that correlation does not imply causation?
16. A random sample of 100 vehicles on I-15 between Las Vegas and Los Angeles finds a mean speed of 80 miles per hour, with a standard deviation of 20 miles per hour. Find a 95% two-tailed confidence interval for the freeway speed. Show your work.
17. (8 pts) Draw a graph of #17, well and fully labeled.
18. (8 pts) A sample of 9 shoppers at Best Buy finds that the mean time spent in the store before making a purchase is 25 minutes, with a standard deviation of 12 minutes. What is the 95% two-tailed confidence interval for this?
19. (8 pts) Major league baseball knows that baseball games in the National League take an average of 180 minutes to play. MLB samples 100 games in the American League and finds a mean time of 200 minutes, standard deviation of 40 minutes. Test the hypothesis that the games are the same length in both leagues. Show your work.
 Ho: _____ Ha: _____
 Test Statistic: _____ Critical Value: _____
 Accept or Reject? _____
20. (8 pts) Draw a graph of #19, well and fully labeled.

21. (8 pts) Ferrari knows that its aluminum brakes will stop a car from 100 mph in 150 feet. They develop new carbon fiber brakes. A random sample of 16 vehicles with the new brakes shows a mean stopping distance of 130 feet from 100 miles per hour, with a standard deviation of 20 miles per hour. Test the hypothesis that the new brakes are better. Show your work.
 Ho: _____ Ha: _____
 Test Statistic: _____ Critical Value: _____
 Accept or Reject? _____
22. (8 pts) Draw a graph of #21, well and fully labeled.
23. (6 pts)
- What does question #19 tell us about the length of NL and AL games?
 - What does question #21 tell us about the stopping distance of the new brakes compared to the old?
24. Using the attached regression, fill in the blanks.
- The regression equation is:
 - _____ percent of the variation in Y is explained by X
 - On average, each estimate of Y is in error by _____
 - This relationship is _____ (Inverse/direct/neither)
 - We expect to make \$ _____ in profit for each additional unit sold
 - We expect our profit to be \$ _____ if we sell 2,000 units.
 - Is the regression statistically significant? What number told you that?

SUMMARY OUTPUT

Regression Statistics
 Multiple R 0.967456
 R Square 0.935971
 Adjusted R 0.927967
 Square
 Standard 2367.352
 Error
 Observatio 10
 ns

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	6.55E+08	6.55E+08	116.943	4.72E-06
Residual	8	44834842	5604355		
Total	9	7E+08			

	<i>Coefficient</i>	<i>Standard</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower</i>	<i>Upper</i>
	<i>s</i>	<i>Error</i>			<i>95.0%</i>	<i>95.0%</i>	<i>95.0%</i>	<i>95.0%</i>
Intercept	4393.288	2086.121	2.105961	0.068301	-417.314	9203.891	-417.314	9203.891
Sales	9.076169	0.839297	10.81402	4.72E-06	7.140748	11.01159	7.140748	11.01159