STATISTICS 2023 NAME, IN INK_____

EXAM THREE SIGNATURE, IN INK_____

SPRING 1992 SS NUMBER, IN INK_____

If you do not want this exam returned publicly state that on the top.
TRUE OR FALSE. Answer with a capital T or F. (3 points each)

_____ 1. The probability that the true parameter value is in a 90% confidence interval to estimate that parameter is at least 90%.

_____ 2. A point estimate is a sample statistic used to estimate an unknown population parameter.

_____ 3. If the sample size is small ($n < 30$) and the population variance is known then the test statistic is based on the t-distribution.

_____ 4. If the null hypothesis in a hypothesis test is a true statement then the set of possible values of the test statistic and their associated probabilities are known.

_____ 5. If a 90% confidence interval to estimate a population proportion is (0.23, 0.45) then 90% of the time the point estimate for the population proportion will be between 0.23 and 0.45.

_____ 6. The width of a confidence interval will decrease when the level of confidence increases if the sample size and sample variance remain the same.

_____ 7. The point estimate for the population parameter is used as the center value in a confidence interval to estimate that population parameter.

_____ 8. A 95% confidence interval to estimate a population parameter from a large sample is approximately two standard errors wide.

_____ 9. If the p-value of a hypothesis test is 0.08 then the null hypothesis should be rejected for a maximum allowable error rate of 5%.

_____ 10. The p-value in a hypothesis test is the error rate we must be willing to tolerate if we reject the null hypothesis.

_____ 11. The p-value of a hypothesis test is the tail area associated with the rejection region.

STATE THE ANSWER. State the answer on the line given.
(3 points each)

_____ 12. If two samples both with 18 observations had variances of 24.1 and 52.4 respectively what is the value of the pooled variance estimate based on these two samples? Round your answer to one digit past the decimal.

_____ 13. What is the value of the estimated standard error of the point estimate for a population proportion if a sample of size 200 yielded an observed proportion of .53?

_____ 14. What is the value of the number which would be labelled as $t_{.025(9)}$?

_____ 15. If the rejection region in a two tail hypothesis test based on a large sample is below -2.576 and above 2.576 what is the maximum error rate of rejecting a true null hypothesis which this researcher will tolerate?

_____ 16. If the value of a Z-test statistic is 1.9 and the alternative hypothesis reads "$\mu > 24$" what is the p-value or OSL of this hypothesis test?

_____ 17. In a two-tail hypothesis test on a population mean what is the p-value or OSL of the hypothesis test if the calculated test statistic based on eleven observations is 2.764 and the population variance is unknown?

_____ 18. How large of a sample would be required to estimate the average cost of a medium-sized house to within 2,000 dollars with a 95% confidence interval if the range of house prices is known to be 39,000 dollars?

STATE THE ANSWER. State the answer on the line given.
(3 points each)

_____ 19. If a 99% confidence interval based on a large sample to estimate a population mean is (686, 898) then what is the value of the standard error of the point estimate for the population mean. Round your answer to two digits past the decimal.

_____ 20. Consider a 98% confidence interval to estimate a population mean based on a sample of 625 observations with a sample mean of 425 and a sample standard deviation of 75. How many units wide would such a confidence interval be? Do NOT state the interval. State the WIDTH of the interval.

_____ 21. If a 90% confidence interval to estimate a population mean is (63.5, 95.9) then what is the value of the sample mean? Round your answer to one digit past the decimal.

_____ 22. If the p-value in a left-tail hypothesis test involving a Z-test statistic is equal to 0.025 what is the numerical value of the Z-test statistic?

_____ 23. If a rejection region for a two-tail hypothesis test based on a large sample is below -2.326 and above 2.326 what is the maximum error rate of rejecting a true null hypothesis which this researcher will tolerate?

_____ 24. In a right-tail hypothesis test situation based on one sample of only 15 observations the null hypothesis would be rejected at the 10% significance level if the test statistic was greater than what value?

_____ 25. What is the p-value in a left-tail hypothesis test if the Z test statistic is equal to -.88?

FILL IN THE CORRECT SYMBOL. Write the correct symbol in the blank. (3 points each)

_____ 26. Estimated standard error of the point estimate for the population mean.

_____ 27. Point estimate for the population mean.

_____ 28. Point estimate for the population variance

FILL IN THE BLANK. Write the correct word or words in the space provided. (2 points each)

29. Confidence intervals are centered around the value of the _____ for the parameter being estimated.

30. Hypotheses are typically statements about values of _____.

31. All t and Z test statistic values are constructed by subtracting the hypothesized parameter value from the _____ and dividing by the _____.

32. In a hypothesis test what is being tested is stated in the _____ hypothesis and what a researcher wants to prove is stated in the _____ hypothesis.

33. If the alternative hypothesis in a hypothesis test is $\mu > 50$ then the hypothesis test is a _____ tail test.

34. If the p-value in a hypothesis test is 0.003 then there is adequate statistical evidence to support the _____ hypothesis.