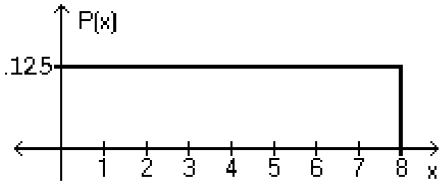
Read these directions carefully. Take your time and check your work. Many students do not take enough time on these tests. Note: on this test we will **not** be omitting a problem.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Using the following uniform density curve, answer the question.



1) What is the probability that the random variable has a value less than 8? 1) _____

A) 0.875 B) 1.000 C) 0.750 D) 1.125

Find the indicated value.

2) $z_{0.02}$ 2) _____

A) 2.05 B) 1.99 C) 2.72 D) 1.78

Solve the problem. Round to the nearest tenth unless indicated otherwise.

3) A bank's loan officer rates applicants for credit. The ratings are normally distributed with a mean of 200 and a standard deviation of 50. Find P_{60}, the score which separates the lower 60% from the top 40%. 3) _____

A) 187.5 B) 207.8 C) 211.3 D) 212.5

Solve the problem.

4) A bank's loan officer rates applicants for credit. The ratings are normally distributed with a mean of 200 and a standard deviation of 50. If 40 different applicants are randomly selected, find the probability that their mean is above 215. 4) _____

A) 0.0287 B) 0.1179 C) 0.3821 D) 0.4713

Find the indicated probability.

5) The volumes of soda in quart soda bottles are normally distributed with a mean of 32.3 oz and a standard deviation of 1.2 oz. What is the probability that the volume of soda in a randomly selected bottle will be less than 32 oz? 5) _____

A) 0.5987 B) 0.3821 C) 0.0987 D) 0.4013

Solve the problem.

6) A study of the amount of time it takes a mechanic to rebuild the transmission for a 2005 Chevrolet Cavalier shows that the mean is 8.4 hours and the standard deviation is 1.8 hours. If 40 mechanics are randomly selected, find the probability that their mean rebuild time exceeds 7.7 hours. 6) _____

A) 0.8531 B) 0.9931 C) 0.9712 D) 0.9634

The given values are discrete. Use the continuity correction and describe the region of the normal distribution that corresponds to the indicated probability.

7) The probability of at least 48 boys 7) _____

A) The area to the right of 48.5 B) The area to the right of 48

C) The area to the right of 47.5 D) The area to the left of 47.5

For the binomial distribution with the given values for n and p, state whether or not it is suitable to use the normal distribution as an approximation.

8) n = 63 and p = 0.7 8) _____

A) Normal approximation is not suitable. B) Normal approximation is suitable.

Estimate the indicated probability by <u>using the normal distribution as an approximation to the binomial distribution</u>.

9) A certain question on a test is answered correctly by 22% of the respondents. Estimate the probability that among the next 150 responses there will be at most 40 correct answers. 9) _____

A) 0.1003 B) 0.0694 C) 0.8997 D) 0.9306

Solve the problem.

10) The following confidence interval is obtained for a population proportion, p: $0.537 < p < 0.563$. Use these confidence interval limits to find the point estimate, $\hat{p}$. 10) _____

A) 0.550 B) 0.537 C) 0.555 D) 0.545

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion p.

11) $n = 97$, $x = 46$; 98% confidence 11) _____

A) $0.356 < p < 0.592$ B) $0.374 < p < 0.574$

C) $0.375 < p < 0.573$ D) $0.355 < p < 0.593$

Use the given data to find the minimum sample size required to estimate the population proportion.

12) Margin of error: 0.05; confidence level: 95%; $\hat{p}$ and $\hat{q}$ unknown 12) _____

A) 318 B) 419 C) 385 D) 404

13) Margin of error: 0.01; confidence level: 95%; from a prior study, $\hat{p}$ is estimated by the decimal equivalent of 52%. 13) _____

A) 16,551 B) 8630 C) 9589 D) 19,976

Use the confidence level and sample data to find a confidence interval for estimating the population μ. Round your answer to the same number of decimal places as the sample mean.

14) A random sample of 105 light bulbs had a mean life of $\bar{x} = 441$ hours with a standard deviation of $\sigma = 40$ hours. Construct a 90% confidence interval for the mean life, μ, of all light bulbs of this type. 14) _____

A) 433 hr $< \mu <$ 449 hr B) 432 hr $< \mu <$ 450 hr

C) 435 hr $< \mu <$ 447 hr D) 431 hr $< \mu <$ 451 hr

Do one of the following, as appropriate: (a) Find the critical value $z_{\alpha/2}$, (b) find the critical value $t_{\alpha/2}$, (c) state that neither the normal nor the t distribution applies.

15) 90%; n = 10; σ is unknown; population appears to be normally distributed. 15) _____

A) $t_{\alpha/2} = 1.812$ B) $t_{\alpha/2} = 1.833$ C) $z_{\alpha/2} = 2.262$ D) $z_{\alpha/2} = 1.383$

Use the given degree of confidence and sample data to construct a confidence interval for the population mean μ. Assume that the population has a normal distribution.

16) Thirty randomly selected students took the calculus final. If the sample mean was 83 and the standard deviation was 13.5, construct a 99% confidence interval for the mean score of all students. 16) _____

A) $78.81 < \mu < 87.19$ B) $76.23 < \mu < 89.77$

C) $76.93 < \mu < 89.07$ D) $76.21 < \mu < 89.79$

17) Which of the following statistics is a biased estimator of the population parameter? 17) _____

A) Sample mean used to estimate the population mean.

B) Sample median used to estimate the population median.

C) Sample proportion used to estimate the population proportion.

D) Sample variance used to estimate the population variance.

18) When we find a 99% confidence interval for the mean of a population we know that 18) _____

A) There is a 99% chance that the sample mean is in the interval we find.

B) There is a 99% chance that the popution mean is in the interval we find.

C) 99% of the time we find such a confdence interval, the sample mean is in the interval.

D) 99% of the time we find such a confdence interval, the population mean is in the interval.

Answer Key
Testname: 2011 FALL TEST 3 PART 1

1) B
2) A
3) D
4) A
5) D
6) B
7) C
8) B
9) D
10) A
11) A
12) C
13) C
14) C
15) B
16) D
17) B
18) D