Name_____ Course Number:_____ Section Number:_____

Directions: Answer the questions in the spaces provided, or attach paper. Circle the correct choice for each response set. If required, show calculations in the blank spaces near the problems.

Provide an appropriate response.

1) If selecting samples of size n = 10 from a population with a known mean and standard deviation, what requirement, if any, must be satisfied in order to assume that the distribution of the sample means is a normal distribution?

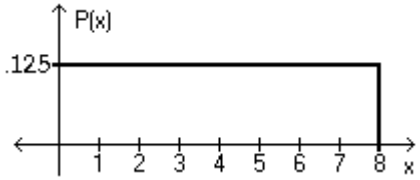
A) The population must have a normal distribution.

B) The population must have a standard deviation of 1.

C) The population must have a mean of 1.

D) None; the distribution of sample means will be approximately normal.

Using the following uniform density curve, answer the question.

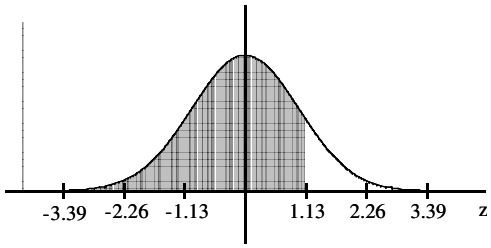


2) What is the probability that the random variable has a value greater than 3?

A) 0.575 B) 0.625 C) 0.500 D) 0.750

Find the area of the shaded region. The graph depicts the standard normal distribution with mean 0 and standard deviation 1.

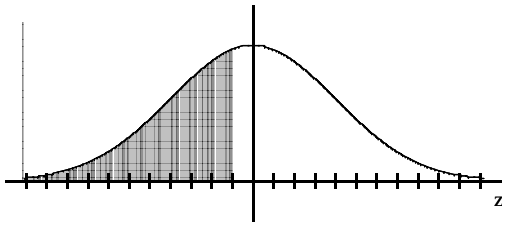
3)



A) 0.8708 B) 0.8907 C) 0.1292 D) 0.8485

Find the indicated z score. The graph depicts the standard normal distribution with mean 0 and standard deviation 1.

4) Shaded area is 0.4013.



A) 0.57 B) −0.57 C) 0.25 D) −0.25

If z is a standard normal variable, find the probability.

5) The probability that z lies between 0.7 and 1.98

A) 0.2175 B) 0.2181 C) −0.2181 D) 1.7341

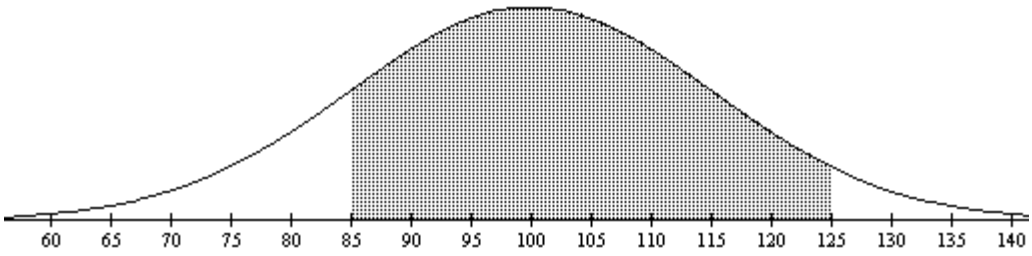
Solve the problem.

6) For a standard normal distribution, find the percentage of data that are more than 1 standard deviation away from the mean.

A) 31.74% B) 68.26% C) 15.87% D) 34.13%

Provide an appropriate response.

7) Find the area of the shaded region. The graph depicts IQ scores of adults, and those scores are normally distributed with a mean of 100 and a standard deviation of 15 (as on the Wechsler test).



A) 0.7745 B) 0.7619 C) 0.7303 D) 0.7938

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

8) Scores on an English test are normally distributed with a mean of 33.8 and a standard deviation of 8.5. Find the score that separates the top 59% from the bottom 41%

A) 28.8 B) 38.8 C) 31.8 D) 35.8

Find the indicated probability.

9) The diameters of bolts produced by a certain machine are normally distributed with a mean of 0.30 inches and a standard deviation of 0.01 inches. What percentage of bolts will have a diameter greater than 0.32 inches?

A) 97.72% B) 2.28% C) 37.45% D) 47.72%

Provide an appropriate response.

10) A poll of 1700 randomly selected students in grades 6 through 8 was conducted and found that 53% enjoy playing sports. Is the 53% result a statistic or a parameter? Explain.

Solve the problem.

11) The amount of snowfall falling in a certain mountain range is normally distributed with a mean of 74 inches, and a standard deviation of 12 inches. What is the probability that the mean annual snowfall during 36 randomly picked years will exceed 76.8 inches?

A) 0.0026 B) 0.0808 C) 0.5808 D) 0.4192

12) In one region, the September energy consumption levels for single–family homes are found to be normally distributed with a mean of 1050 kWh and a standard deviation of 218 kWh. If 50 different homes are randomly selected, find the probability that their mean energy consumption level for September is greater than 1075 kWh.

A) 0.0438 B) 0.2090 C) 0.4562 D) 0.2910

13) A final exam in Math 160 has a mean of 73 with standard deviation 7.8. If 24 students are randomly selected, find the probability that the mean of their test scores is less than 76.

A) 0.8962 B) 0.0301 C) 0.9699 D) 0.9203

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

14) The probability of more than 56 correct answers

A) The area to the left of 56.5 B) The area to the right of 55.5

C) The area to the right of 56 D) The area to the right of 56.5

15) The probability of exactly 37 green marbles

A) The area between 36.5 and 37 B) The area between 37 and 37.5

C) The area between 36.5 and 37.5 D) The area between 36.5 and 38.5

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.

16) n = 12 and p = 0.5

A) Normal approximation is not suitable.

B) Normal approximation is suitable.

Estimate the indicated probability by using the normal distribution as an approximation to the binomial distribution.

17) 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.

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

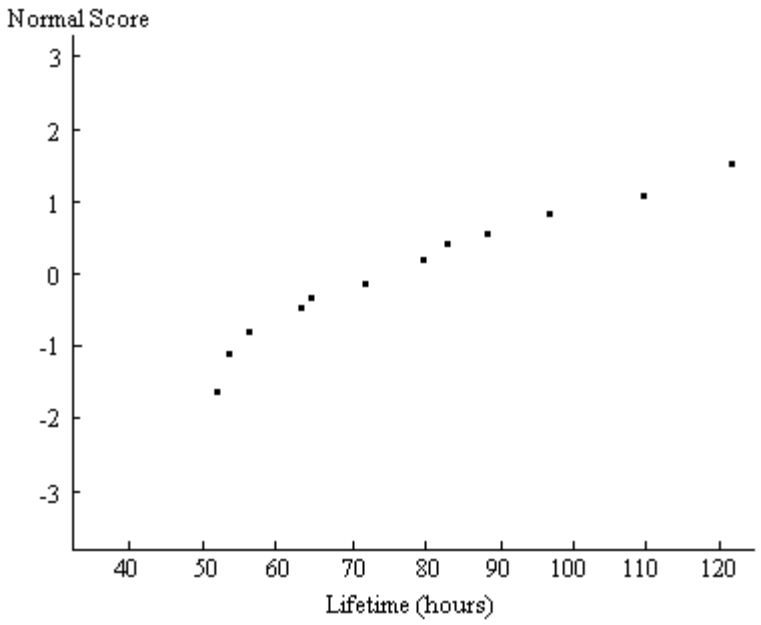
Use the normal distribution to approximate the desired probability.

18) A coin is tossed 20 times. A person, who claims to have extrasensory perception, is asked to predict the outcome of each flip in advance. She predicts correctly on 14 tosses. What is the probability of being correct 14 or more times by guessing? Does this probability seem to verify her claim?

A) 0.4418, no B) 0.0582, no C) 0.4418, yes D) 0.0582, yes

Solve the problem.

19) A normal quartile plot is given below for the lifetimes (in hours) of a sample of batteries of a particular brand. Use the plot to assess the normality of the lifetimes of these batteries. Explain your reasoning.



Examine the given data set and determine whether the requirement of a normal distribution is satisfied. Assume that the requirement for a normal distribution is loose in the sense that the population distribution need not be exactly normal, but it must have a distribution which is basically symmetric with only one mode. Explain why you do or do not think that the requirement is satisfied.

20) The data below represents the amount of television watched per week (in hours) for 40 randomly selected teenagers.
(Hint: Use computer assistance.)

13	4	17	14	9	6	7	5	14	12
20	16	0	15	10	6	5	3	13	14
15	5	3	5	8	11	12	13	14	7
4	6	9	13	3	14	24	15	17	20

1) A
2) B
3) A
4) D
5) B
6) A
7) D
8) C
9) B
10) Statistic, because it is calculated from a sample, not a population.
11) B
12) B
13) C
14) D
15) C
16) B
17) C
18) B
19) Since the normal quartile plot displays curvature, it appears that lifetimes of these batteries are probably not normally distributed.
20) The requirement for normality is satisfied since a histogram of the data is roughly bell–shaped; and there is one mode. Further, STATDISK's Ryan–Joiner test confirms normality, given the normal quantile plot of the data points.