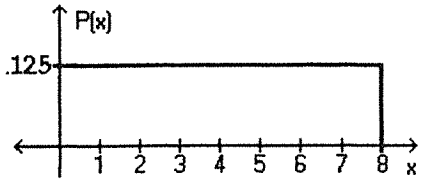
Name: _____ Chs RV for Test

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 numbers obtained on 50 rolls of a die.

1	5	5	3	6	4	5	6	3	4
2	5	3	5	4	2	1	4	3	1
6	1	2	6	1	2	5	3	3	4
4	1	3	1	6	2	2	5	5	3
3	5	1	6	2	1	1	4	6	5

Using the following uniform density curve, answer the question.



3) What is the probability that the random variable has a value less than 4.4?

A) 0.3000 B) 0.4250 C) 0.6750 D) 0.5500

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

4) The probability that Z lies between 0.7 and 1.98

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

The Precision Scientific Instrument Company manufactures thermometers that are supposed to give readings of 0°C at the freezing point of water. Tests on a large sample of these thermometers reveal that at the freezing point of water, some give readings below 0°C (denoted by negative numbers) and some give readings above 0°C (denoted by positive numbers). Assume that the mean reading is 0°C and the standard deviation of the readings is 1.00°C. Also assume that the frequency distribution of errors closely resembles the normal distribution. A thermometer is randomly selected and tested. Find the temperature reading corresponding to the given information.

5) A quality control analyst wants to examine thermometers that give readings in the bottom 4%. Find the reading that separates the bottom 4% from the others.

A) -1.89° B) -1.48° C) -1.63° D) -1.75°

Solve the problem.

6) For a standard normal distribution, find the percentage of data that are more than 2 standard deviations below the mean or more than 3 standard deviations above the mean.

A) 4.56% B) 0.26% C) 97.59% D) 2.41%

Assume that X has a normal distribution, and find the indicated probability.

7) The mean is $\mu = 60.0$ and the standard deviation is $\sigma = 4.0$.
Find $P(X < 53.0)$.

A) 0.0401 B) 0.5589 C) 0.9599 D) 0.0802

Use the continuity correction and describe the region of the normal curve that corresponds to the indicated binomial probability.

15) The probability of exactly 37 green marbles

A) The area between 36.5 and 37.5

B) The area between 37 and 37.5

C) The area between 36.5 and 37

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) $n = 15$ and $p = .8$

A) Normal approximation is suitable.

B) Normal approximation is not suitable.

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

17) A product is manufactured in batches of 120 and the overall rate of defects is 5%. Estimate the probability that a randomly selected batch contains more than 6 defects.

A) 0.5871 B) 0.4168 C) 0.4641 D) 0.0832

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 16 tosses. What is the probability of being correct 16 or more times by guessing? Does this probability seem to verify her claim?

A) .0069 , no B) .4931 , yes C) .0069 , yes D) .4931 , no

Solve the problem.

19) In a game of roulette, Jorge places 170 bets of $1 each on the number 3. A win pays off with odds 35:1 and on any one spin there is a 1/38 probability that 3 will be the winning number. Among the 170 bets, what is the minimum number of wins needed for Jorge to make a profit? Estimate the probability that Jorge will make a profit.

A) 6; 0.3121 B) 6; 0.2327 C) 5; 0.496 D) 5: 0.4013

Find the indicated probability.

8) The incomes of trainees at a local mill are normally distributed with a mean of $1100 and a standard deviation $150. What percentage of trainees earn less than $900 a month?

A) 40.82% B) 9.18% C) 35.31% D) 90.82%

Solve the problem.

9) A certain grade egg must weigh at least 2 oz. If the weights of eggs are normally distributed with a mean of 1.5 oz and a standard deviation of 0.4 oz, approximately how many eggs in a random sample of 21 dozen would you expect to weigh more than 2 oz?

A) 11 B) 99 C) 27 D) 2

10) Scores on a test are normally distributed with a mean of 63.9 and a standard deviation of 10.9. Find the value of P_{81}.

A) 67.1 B) 0.291 C) 73.5 D) 0.88

11) Scores on a test have a mean of 67 and Q_3 is 85. The scores have a distribution that is approximately normal. Find the standard deviation. Round your answer to the nearest tenth.

A) 12.1 B) 13.5 C) 24 D) 26.9

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) 0.2090 B) 0.2910 C) 0.0438 D) 0.4562

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 greater than 78.

A) 0.0008 B) 0.8962 C) 0.0036 D) 0.0103

14) For women aged 18–24, systolic blood pressures (in mm Hg) are normally distributed with a mean of 114.8 and a standard deviation of 13.1. If 36 women are selected at random from a population of 300 women aged 18–24, find the probability that their mean systolic blood pressure will be less than 110 mm Hg. Assume that the sampling is done without replacement and use a finite population correction factor with N = 300.

A) 0.0096 B) 0.3483 C) 0.0146 D) 0.3557