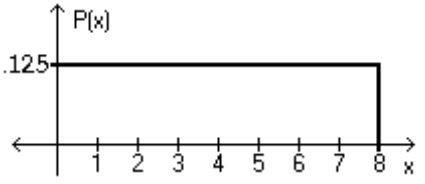
STA2023 . Chapter 6: The Standard Normal distribution.

Practice 6. Broward College.

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 greater than 5? 1) _____

A) 0.250 B) 0.325 C) 0.500 D) 0.375

2) What is the probability that the random variable has a value greater than 3.3? 2) _____

A) 0.5875 B) 0.4625 C) 0.5375 D) 0.7125

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

A) 0.250 B) 0.500 C) 0.375 D) 0.125

4) What is the probability that the random variable has a value greater than 1? 4) _____

A) 0.875 B) 0.825 C) 1.000 D) 0.750

5) What is the probability that the random variable has a value greater than 1.4? 5) _____

A) 0.7750 B) 0.9500 C) 0.8250 D) 0.7000

6) What is the probability that the random variable has a value less than 5? 6) _____

A) 0.375 B) 0.625 C) 0.500 D) 0.750

Assume that the weight loss for the first month of a diet program varies between 6 pounds and 12 pounds, and is spread evenly over the range of possibilities, so that there is a uniform distribution. Find the probability of the given range of pounds lost.

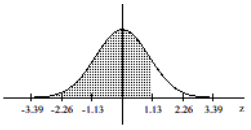
7) More than 10 pounds 7) _____

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) $\frac{1}{7}$ D) $\frac{5}{6}$

8) Between 7 pounds and 10 pounds 8) _____

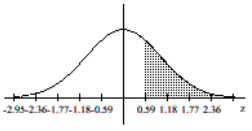
A) $\frac{1}{3}$ B) $\frac{1}{4}$ C) $\frac{2}{3}$ D) $\frac{1}{2}$

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

9) 

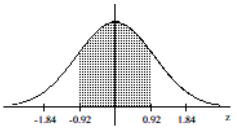

9) _____

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

10) 


10) _____

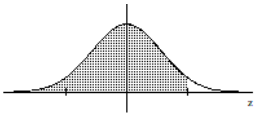
A) 0.7224 B) 0.2224 C) 0.2190 D) 0.2776

11) 


11) _____

A) 0.1788 B) 0.6424 C) 0.8212 D) 0.3576

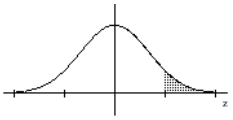
Find the indicated z score. The graph depicts the standard normal distribution with mean 0 and standard deviation 1.

12) Shaded area is 0.9599. 


12) _____

A) -1.38 B) 1.82 C) 1.03 D) 1.75

13) Shaded area is 0.0694. 13) _____



A) 1.48 B) 1.45 C) 1.26 D) 1.39

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

14) The probability that z lies between 0 and 3.01 14) _____
A) 0.5013 B) 0.1217 C) 0.9987 D) 0.4987

15) The probability that z lies between -2.41 and 0 15) _____
A) 0.0948 B) 0.4920 C) 0.4910 D) 0.5080

16) The probability that z is less than 1.13 16) _____
A) 0.8485 B) 0.8708 C) 0.1292 D) 0.8907

Find the indicated value.

17) $z_{0.005}$ 17) _____
A) 2.015 B) 2.835 C) 2.575 D) 2.535

Provide an appropriate response.

18) Assume that adults have IQ scores that are normally distributed with a mean of 100 and a standard deviation of 15 (as on the Wechsler test). Find the probability that a randomly selected adult has an IQ between 90 and 120 (somewhere in the range of normal to bright normal). 18) _____
A) 0.6568 B) 0.6014 C) 0.6227 D) 0.6977

19) Assume that adults have IQ scores that are normally distributed with a mean of 100 and a standard deviation of 15 (as on the Wechsler test). Find $P_{10}$, which is the IQ score separating the bottom 10% from the top 90%. 19) _____
A) 81.9 B) 81.3 C) 80.1 D) 80.8

20) Assume that adults have IQ scores that are normally distributed with a mean of 100 and a standard deviation of 15 (as on the Wechsler test). Find the IQ score separating the top 16% from the others. 20) _____
A) 85.0 B) 108.1 C) 114.9 D) 99.1

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

21) 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. Find $P_{45}$, which is the consumption level separating the bottom 45% from the top 55%. 21) _____
A) 1078.3 B) 1148.1 C) 1087.8 D) 1021.7

22) Scores on a test are normally distributed with a mean of 68.9 and a standard deviation of 11.6. Find $P_{81}$, which separates the bottom 81% from the top 19%. 22) _____
A) 72.3 B) 79.1 C) 0.88 D) 0.291

23) 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%. 23) _____

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

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

24) The mean is $\mu = 60.0$ and the standard deviation is $\sigma = 4.0$. Find the probability that X is less than 53.0. 24) _____

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

25) The mean is $\mu = 15.2$ and the standard deviation is $\sigma = 0.9$. Find the probability that X is greater than 15.2. 25) _____

A) 1.0000 B) 0.9998 C) 0.5000 D) 0.0003

26) The mean is $\mu = 15.2$ and the standard deviation is $\sigma = 0.9$. Find the probability that X is greater than 16.1. 26) _____

A) 0.1357 B) 0.1550 C) 0.1587 D) 0.8413

Find the indicated probability.

27) 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? 27) _____

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

28) The incomes of trainees at a local mill are normally distributed with a mean of $1100 and a standard deviation of $150. What percentage of trainees earn less than $900 a month? 28) _____

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

29) 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? 29) _____

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

Solve the problem.

30) The amount of snowfall falling in a certain mountain range is normally distributed with a mean of 89 inches, and a standard deviation of 14 inches. What is the probability that the mean annual snowfall during 49 randomly picked years will exceed 91.8 inches? 30) _____

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

31) The annual precipitation amounts in a certain mountain range are normally distributed with a mean of 85 inches, and a standard deviation of 14 inches. What is the probability that the mean annual precipitation during 49 randomly picked years will be less than 87.8 inches? 31) _____

A) 0.9192 B) 0.5808 C) 0.4192 D) 0.0808

32) The weights of the fish in a certain lake are normally distributed with a mean of 18 lb and a standard deviation of 12. If 16 fish are randomly selected, what is the probability that the mean weight will be between 15.6 and 21.6 lb? 32) _____

A) 0.0968 B) 0.6730 C) 0.3270 D) 0.4032