Chapter 7
Continuous Probability Distributions

True/False

1. Areas within a continuous probability distribution represent probabilities.

2. The total area within any continuous probability distribution is equal to 1.00

3. Some normal probability distributions have equal arithmetic means, but their standard deviations may be different.

4. Some normal probability distributions have different arithmetic means and different standard deviations.

5. For a normal probability distribution, about 95 percent of the area under normal curve is within plus and minus two standard deviations of the mean and practically all (99.73 percent) of the area under the normal curve is within three standard deviations of the mean.
Answer: 5. True Difficulty: Easy Goal: 6 AACSB: AS

6. The area under the normal curve within plus and minus one standard deviation of the mean is about 68.26%.

7. The total area under the normal curve is 100%.

8. A z-score is the distance between a selected value (X) and the population mean (μ) divided by the population standard deviation (σ).

9. In terms of a formula the standardized value of z is found by $z = (X - \mu)/\sigma$.

10. The mean (μ) divides the normal curve into two identical halves.

11. The number of different normal distributions is unlimited.

12. The mean of a normal distribution is represented by σ .

13. The standard normal distribution is a special normal distribution with a mean of 0 and a standard deviation of 1.

14. A computed z for X values to the right of the mean is negative.

15. A computed z for X values to the left of the mean is positive.

16. The number of different standard normal distributions is unlimited.

Multiple Choice

17. Which of the following is NOT true regarding the normal distribution?
A) Mean, median and mode are all equal
B) It has a single peak
C) It is symmetrical
D) The points of the curve meet the X-axis at z = –3 and z = 3

18. For the normal distribution, the mean plus and minus 1.96 standard deviations will include about what percent of the observations?
A) 50%
B) 99.7%
C) 95%
D) 68%

19. For a standard normal distribution, what is the probability that z is greater than 1.75?
A) 0.0401
B) 0.0459
C) 0.4599
D) 0.9599

20. What is the area under the normal curve between z = 0.0 and z = 1.79?
A) 0.4633
B) 0.0367
C) 0.9599
D) 0.0401

21. What is the area under the normal curve between z = –1.0 and z = –2.0?
A) 0.0228
B) 0.3413
C) 0.1359
D) 0.4772

22. What is the area under the normal curve between z = 0.0 and z = 2.0?
A) 1.0000
B) 0.7408
C) 0.1359
D) 0.4772

23. The mean amount spent by a family of four on food per month is $500 with a standard deviation of $75. Assuming that the food costs are normally distributed, what is the probability that a family spends less than $410 per month?
A) 0.2158
B) 0.8750
C) 0.0362
D) 0.1151

24. What is the proportion of the total area under the normal curve within plus and minus two standard deviations of the mean?
A) 68%
B) 99.7%
C) 34%
D) 95%

25. The mean score of a college entrance test is 500; the standard deviation is 75. The scores are normally distributed. What percent of the students scored below 320?
A) About 50.82%
B) About 34.13%
C) About 7.86%
D) About 0.82%

26. The mean of a normally distributed group of weekly incomes of a large group of executives is $1,000 and the standard deviation is $100. What is the z-score for an income of $1,100?
A) 1.00
B) 2.00
C) 1.683
D) -0.90
Answer: 26. A Difficulty: Medium Goal: 5 AACSB: AS

27. A new extended-life light bulb has an average service life of 750 hours, with a standard deviation of 50 hours. If the service life of these light bulbs approximates a normal distribution, about what percent of the distribution will be between 600 hours and 900 hours?
A) 95%
B) 68%
C) 34%
D) 99.7%
Answer: 27. D Difficulty: Medium Goal: 6

28. The mean of a normal distribution is 400 pounds. The standard deviation is 10 pounds. What is the area between 415 pounds and the mean of 400 pounds?
A) 0.5000
B) 0.1932
C) 0.4332
D) 0.3413
Answer: 28. C Difficulty: Medium Goal: 6

29. The distribution of the annual incomes of a group of middle management employees approximated a normal distribution with a mean of $37,200 and a standard deviation of $800. About 68 percent of the incomes lie between what two incomes?
A) $30,000 and $40,000
B) $36,400 and $38,000
C) $34,800 and $39,600
D) $35,600 and $38,800
Answer: 29. B Difficulty: Medium Goal: 6

30. The total area of a normal probability distribution is
A) between –3.0 and 3.0
B) 1.00
C) dependent on a value of 'z'.
D) approximated by the binomial distribution.
Answer: 30. B Difficulty: Easy Goal: 4

31. An area of a normal probability distribution represents
A) a permutation
B) a combination
C) a likelihood
D) a shaded area
Answer: 31. C Difficulty: Easy Goal: 6

32. The weight of cans of fruit is normally distributed with a mean of 1,000 grams and a standard deviation of 50 grams. What percent of the cans weigh 860 grams or less?
A) 0.0100
B) 0.8400

C) 0.0026
D) 0.0001
33. What is the distribution with a mean of 0 and a standard deviation of 1 called?
A) Frequency distribution
B) z-score
C) Standard normal distribution
D) Binomial probability distribution

Use the following to answer questions 34-39:
A sample of 500 evening students revealed that their annual incomes from employment in industry during the day were normally distributed with a mean income of $30,000 and a standard deviation of $3,000.

34. How many students earned more than $30,000? _____

35. How many students earned between $27,000 and $33,000? _____

36. How many students earned between $24,000 and $30,000? _____

37. How many students earned between $20,000 and $40,000? _____

38. How many students earned less than $22,500? _____

39. How many students earned more than $36,000? _____

Multiple Choices
Use the following to answer questions 40-42:
The average score of 100 students taking a statistics final was 70 with a standard deviation of 7.

40. Assuming a normal distribution, approximately how many scored 90 or higher?
A) 0.4979
B) 0.0021
C) 0.9979
D) 2.86

41. Assuming a normal distribution, approximately how many scored less than 60?
A) 0.2271
B) 0.3729
C) 0.8929
D) – 1.14
E) None of the above

42. Assuming a normal distribution, approximately how many scored greater than 65?
A) 0.2611
B) 0.2389
C) 0.7611
D) –0.714

Answer

1. True	2. True	3. True	4. True	6. True	7. True	8. True
9. True	10. True	11. True	12. False	13. True	14. False	15. False
16. False						
17. D	18. C	19. A	20. A	21. C	22. D	23. D
24. D	25. D	32. C	33. C	34. 250	35. 341	36. 239
37. 500	38. 3	39. 11	40. B	41. E	42. C	