7.12: Solutions

1.

a. $U(24, 26)$, 25, 0.5774
b. $N(25, 0.0577)$
c. 0.0416

3. 0.0003

5. 25.07

7.

a. $N(2{,}500, 5.7735)$
b. 0

9. 2,507.40

13. $N(10, \frac{10}{8}))$

15. 0.7799

17. 1.69

19. 0.0072

21. 391.54

23. 405.51

25. Mean = 25, standard deviation = 2/7

26. Mean = 48, standard deviation = 5/6

27. Mean = 90, standard deviation = 3/4

28. Mean = 120, standard deviation = 0.38

29. Mean = 17, standard deviation = 0.17

30. Expected value = 17, standard deviation = 0.05

31. Expected value = 38, standard deviation = 0.43

32. Expected value = 14, standard deviation = 0.65

33. 0.23

34. 0.060

35. 1/5

36. 0.063

37. 1/3

38. 0.056

39. 1/10

40. 0.042

41. 0.999

42. 0.901

43. 0.301

44. 0.832

45. 0.483

46. 0.500

47. 0.502

48. 0.519

49.

a. X = amount of change students carry
b. $X \sim E(0.88, 0.88)$
c. $\bar{X}$ = average amount of change carried by a sample of 25 students.
d. $\bar{X} \sim N(0.88, 0.176)$
e. 0.0819
f. 0.1882
g. The distributions are different. Part a is exponential and part b is normal.

51.

a. length of time for an individual to complete IRS form 1040, in hours.
b. mean length of time for a sample of 36 taxpayers to complete IRS form 1040, in hours.
c. $N(10.53, 13)(10.53, 13)$
d. Yes. I would be surprised, because the probability is almost 0.
e. No. I would not be totally surprised because the probability is 0.2312

53.

a. the length of a song, in minutes, in the collection
b. $U(2, 3.5)$
c. the average length, in minutes, of the songs from a sample of five albums from the collection
d. $N(2.75, 0.066)$
e. 2.74 minutes
f. 0.03 minutes

55.

a. True. The mean of a sampling distribution of the means is approximately the mean of the data distribution.
b. True. According to the Central Limit Theorem, the larger the sample, the closer the sampling distribution of the means becomes normal.
c. The standard deviation of the sampling distribution of the means will decrease making it approximately the same as the standard deviation of X as the sample size increases.

57.

a. X = the yearly income of someone in a third world country
b. the average salary from samples of 1,000 residents of a third world country
c. $\bar{X} \sim N(2000, 80001000\sqrt{})(2000, 80001000)$
d. Very wide differences in data values can have averages smaller than standard deviations.
e. The distribution of the sample mean will have higher probabilities closer to the population mean.
$P(2000 < \bar{X} < 2100) = 0.1537$
$P(2100 < \bar{X} < 2200) = 0.1317$

59.

b

60. 64

61.

a. Yes
b. Yes
c. Yes
d. 0.6

62. 400

63. 2.5

64. 25

65. 0.0087

66. 0.0064, 0.0064

67.

a. It has no effect.
b. It is divided by 2–√2.
c. It is divided by 2.

68.

69.

70. 0.955

71. 0.927

72. 0.648

73. 0.101

74. 0.273
