

5.S: Point Estimates (Solutions- Practice + Homework)

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. $N(10.53, 13)$
- 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. $\bar{X} \sim N(2000, 8000/1000)$
- 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 $2-\sqrt{2}$.
- c. It is divided by 2.

68.

69.

70. 0.955

71. 0.927

72. 0.648

73. 0.101

74. 0.273

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