

## 5.8: Chapter 5 Solutions

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1. a. 10

b. 1.25

3.  $N(10, 1.25)$

5. 0.7799

7. 1.675

9. Mean = 25, standard deviation = 0.29

10. Mean = 48, standard deviation = 0.83

11. Mean = 90, standard deviation = 0.75

12. Mean = 120, standard deviation = 0.38

13. Mean = 17, standard deviation = 0.17

14. Expected value = 17, standard deviation = 0.05

15. Expected value = 38, standard deviation = 0.43

16. Expected value = 14, standard deviation = 0.65

17. 0.9818

18. 0.8788

19. 0.3050

20. 0.8294

21. 0.4884

22. 0.5000

23. 0.4761

24. 0.5160

25.

1.  $X$  = amount of change students carry

2.  $X \sim N(0.88, 0.31)$

3.  $\bar{x}$  = average amount of change carried by a sample of 25 students.

4.  $\bar{x} \sim N(0.88, 0.062)$

5. 0.2543

6. 0.8753

7. The distributions are different. Part 1 is normal for individual observations and part 2 is normal for sample means.

27.

1. length of time for an individual to complete *IRS* form 1040, in hours.

2. mean length of time for a sample of 36 taxpayers to complete *IRS* form 1040, in hours.

3.  $N(10.53, \frac{1}{3})$

4. Yes. I would be surprised, because the probability is almost 0.

5. No. I would not be totally surprised because the probability is 0.2296.

29.

1. the length of a song, in minutes, in the collection

2.  $N(2, 0.43)$

3. the average length, in minutes, of the songs from a sample of five albums from the collection

4.  $N(2.75, 0.066)$

5. 2.706 minutes

6. 0.088 minutes

31.

1. True. The mean of a sampling distribution of the means is approximately the mean of the data distribution.
2. True. According to the Central Limit Theorem, the larger the sample, the closer the sampling distribution of the means becomes normal.
3. The standard deviation of the sampling distribution of the means will decrease as the sample size increases.

33.

1.  $X$  = the yearly income of someone in a third world country
2. the average salary from samples of 1,000 residents of a third world country
3.  $\bar{x} \sim N\left(2000, \frac{8000}{\sqrt{1000}}\right)$
4. Very wide differences in data values can have averages smaller than standard deviations.
5. The distribution of the sample mean will have higher probabilities closer to the population mean.  
 $P(2000 < \bar{x} < 2100) = 0.1537$   
 $P(2100 < \bar{x} < 2200) = 0.1317$

35. b

36. 64

37.

1. Yes
2. Yes
3. Yes
4. 0.6

38. 400

39. 2.5

40. 25

41. 0.955

42. 0.927

43. 0.648

44. 0.101

45. 0.273

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