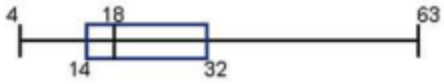
23. Obama: 80.0%. McCain: 91.3%. The variation among the Obama contributions is a little less than the variation among the McCain contributions.
25. Range = 2.950; $s^2 = 0.345$; $s = 0.587$.
27. Range = 36.0 years; $s^2 = 94.5$ years^2; $s = 9.7$ years.
29. 0.738, which is not substantially different from $s = 0.587$.
31. 9.0 years, which is reasonably close to $s = 9.7$ years.
33. No. The pulse rate of 99 beats per minute is between the minimum usual value of 54.3 beats per minute and the maximum usual value of 100.7 beats per minute.
35. Yes. The volume of 11.9 oz is not between the minimum usual value of 11.97 oz and the maximum usual value of 12.41 oz.
37. $s = 12.3$ years. The result is not substantially different from the standard deviation of 11.1 years found from the original list of sample values.
39. $s = 13.5$. The result is very close to the standard deviation of 13.4 found from the original list of sample values.
41. a. 95% b. 68%
43. At least 75% of women have platelet counts within 2 standard deviations of the mean. The minimum is 150 and the maximum is 410.
45. a. 6.9 min^2 b. 6.9 min^2 c. 3.4 min^2
    d. Part (b), because repeated samples result in variances that target the same value (6.9 min^2) as the population variance. Use division by $n - 1$.
    e. No. The mean of the sample variances (6.9 min^2) equals the population variance (6.9 min^2), but the mean of the sample standard deviations (1.9 min) does not equal the mean of the population standard deviation (2.6 min).

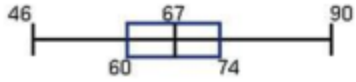
Section 3-4

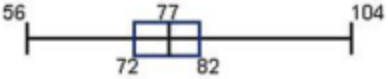
1. Madison's height is below the mean. It is 2.28 standard deviations below the mean.
3. The lowest amount is \$5 million, the first quartile Q_1 is \$47 million, the second quartile Q_2 (or median) is \$104 million, the third quartile Q_3 is \$121 million, and the highest gross amount is \$380 million.
5. a. \$1,268,950 b. 0.16 standard deviations
   c. $z = -0.16$ d. Usual
7. a. \$1,449,778 b. 2.75 standard deviations
   c. $z = -2.75$ d. Unusual
9. z scores: -2 and 2. IQ scores: 70 and 130.
11. 0.084 and 2.396
13. De-Fen Yao is relatively taller, because her z score is 12.33, which is greater than the z score of 10.29 for Sultan Kosen. De-Fen Yao is more standard deviations above the mean than Sultan Kosen.
15. The SAT score of 1490 has a z score of –0.09, and the ACT score of 17.0 has a z score -0.85. The z score of -0.09 is a larger number than the z score of -0.85, so the SAT score of 1490 is relatively better.
17. 13th percentile.
19. 50th percentile.
21. 251 sec (Tech: Excel: 250.8 sec).
23. 255 sec.
25. 247.5 sec.
27. 234.5 sec (Tech: Minitab: 234.25 sec; Excel: 234.75 sec).
29. 5-number summary: 1 sec, 8709 sec, 10,074.5 sec, 11,445 sec, 11,844 sec. (Tech: Minitab yields $Q_1 = 8338$ sec and $Q_3 = 11{,}453$ sec. Excel yields $Q_1 = 8727.75$ sec and $Q_3 = 11{,}115$ sec.)

31. 5-number summary: 4 min, 14.0 min, 18.0 min, 32.0 min, 63 min. (Tech: Minitab yields $Q_1 = 12.75$ min and $Q_3 = 34.25$ min. Excel yields $Q_1 = 14.25$ min and $Q_3 = 31.5$ min.)

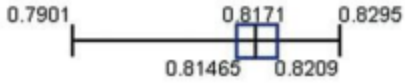


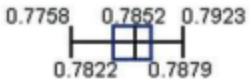
33. The top boxplot represents males. It appears that males have lower pulse rates than females.



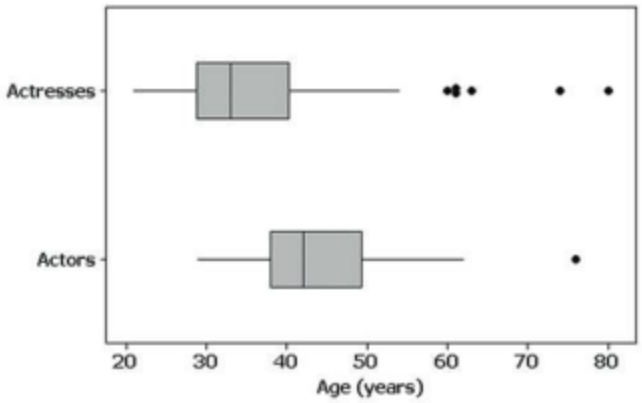


35. The weights of regular Coke represented in the top boxplot appear to be generally greater than those of diet Coke, probably due to the sugar in cans of regular Coke.





37. Outliers for actresses: 60 years, 61 years, 61 years, 63 years, 74 years, 80 years. Outliers for actors: 76 years. The modified boxplots show that only one actress has an age that is greater than any actor.



Chapter 3: Quick Quiz

1. 14.0 min.
2. 12.0 min.
3. 12 min.
4. 25.0 min^2.
5. -0.77.