Practice 3 Solutions

3.28 c/a/m

a. The median is approximately 37.5 defects per day. The first quartile is approximately 37 defects per day. The third quartile is approximately 39 defects per day.

b. The asterisks at the right are outliers, indicating two days on which unusually large numbers of defects were produced. The production supervisor should try to determine if anything out of the ordinary was happening at the plant on those days.

c. The distribution is positively skewed.

3.29 c/a/e

a. At least $(1-(1/2.5^2))*100 = 84\%$

b. At least $(1-(1/3^2))*100 = 88.89\%$

c. At least $(1-(1/5^2))*100 = 96\%$

3.32 c/a/m Using the empirical rule:

a. 95%. This is the percentage of values that are within ±2 standard deviations of the mean.

b. 16%, or 50% - 34%. Recall that 68% of the values are within ±1 standard deviation of the mean.

c. 2.5%, or 50% - 47.5%; 95% of the values are within ±2 standard deviations of the mean.

d. 81.5%, obtained by 34% (the area between the mean and 11,500) plus 47.5% (the area from the mean to 13,000).

3.33 c/a/m Using the empirical rule:

a. 68%. This is the percentage of values that are within ±1 standard deviation of the mean.

b. 2.5%, or 50% - 47.5%; 95% of the values are within ±2 standard deviations of the mean.

c. 84%, or 50% (the area to the left of the mean) plus 34% (the area from the mean to 580).

d. 13.5%, obtained by 47.5% (the area between the mean and 680) minus 34% (the area between the mean and 580).

3.34 c/a/m Coefficient of variation = $s/\bar{x}$ = (140/1235)*100 = 11.34% for data set A. Coefficient of variation = $s/\bar{x}$ = (1.87/15.7)*100 = 11.91% for data set B. Set B has greater relative dispersion.

3.40 c/a/d

m_i	f_i	$f_i m_i$	$f_i m_i^2$
10	7	70	700
20	9	180	3,600
30	12	360	10,800
40	14	560	22,400
50	13	650	32,500
60	9	540	32,400
70	8	560	39,200
80	11	880	70,400
90	10	900	81,000
100	7	700	70,000
	sum = 100	sum = 5400	sum = 363,000

Approximate values are $\bar{x} = 5400/100 = 54$ and $s^2 = \dfrac{363,000 - (100)(54)^2}{99} = 721.21,\ s = 28.86$

3.41 c/a/d

m_i	f_i	$f_i m_i$	$f_i m_i^2$
5	25	125	625
15	17	255	3,825
25	15	375	9,375
35	9	315	11,025
45	10	450	20,250
55	4	220	12,100
	sum = 80	sum = 1740	sum = 57,200

Approximate values: $\bar{x} = 1740/80 = 21.75$ and $s^2 = \dfrac{57,200 - (80)(21.75)^2}{79} = 245.00,\ s = 15.65$