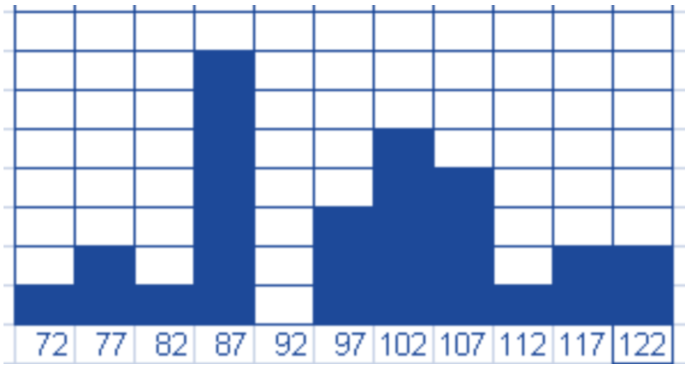
Chapter 8.3 Frequency Tables and Histograms - Answer Key

1a.

70-74	1
75-79	2
80-84	1
85-89	7
90-94	0
95-99	3
100-104	5
105-109	4
110-114	1
115-119	2
120-124	2

1b.

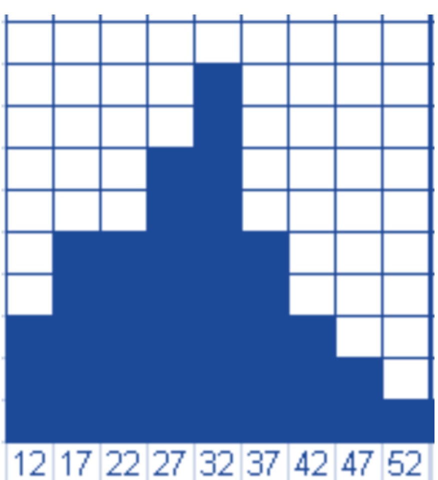


1c. bimodal

2a.

10-14	3
15-19	5
20-24	5
25-29	7
30-34	9
35-39	5
40-44	3
45-49	2
50-54	1

2b.



2c. normal

Chapter 8.4, 8.5 - Descriptive Statistics and Variation - Answer Key

1. The first set because there is more variability in the numbers.

2. They have the same standard deviation since the differences among the data items remains alike in both sets.

3a.

Data: x	Data – Mean: x - $\bar{x}$	(Data - Mean)^2 : (x - $\bar{x}$)^2
6	6 – 7 = -1	(-1)^2 = 1
6	6 – 7 = -1	(-1)^2 = 1
10	10 – 7 = 3	(3)^2 = 9
12	12 – 7 = 5	(5)^2 = 25
3	3 – 7 = 4	(4)^2 = 16
5	5 – 7 = -2	(-2)^2 = 4
		Total: 56

Mean: 7
Median: 6
Range: 9

Divide the total on the (Data - Mean)^2 column by n – 1 (*n: is the sample size*)

$$\frac{56}{6-1} = \frac{56}{5} = 11.2$$

Take the square root of the result above that equals standard deviation

$$\sqrt{11.2} \approx 3.35$$

3b.

Data: x	Data – Mean: x - $\bar{x}$	(Data - Mean)^2 : (x - $\bar{x}$)^2
4	4 – 5 = -1	(-1)^2 = 1
0	0 – 5 = -5	(-5)^2 = 25
3	3 – 5 = -2	(-2)^2 = 4
6	6 – 5 = 1	(1)^2 = 1
9	9 – 5 = 4	(4)^2 = 16
12	12 – 5 = 7	(7)^2 = 49
2	$2 - 5 = -3$	$(-3)^2 = 9$
3	$3 - 5 = -2$	$(-2)^2 = 4$
4	$4 - 5 = -1$	$(-1)^2 = 1$
7	$7 - 5 = 2$	$(2)^2 = 4$
	Total: 114	

Mean: 5
Median: 4
Range: 12

Divide the total on the (Data - Mean)^2 column by n – 1 (*n: is the sample size*)

$$\frac{114}{10-1} = \frac{114}{9} = 12.6$$

Take the square root of the result above that equals standard deviation

$\sqrt{12.6} \approx 3.6$

3c.

Data: x	Data – Mean: x - x̄	(Data - Mean)^2 : (x - x̄)^2
6	6 – 6 = 0	$(0)^2 = 0$
6	6 – 6 = 0	$(0)^2 = 0$
6	6 – 6 = 0	$(0)^2 = 0$
6	6 – 6 = 0	$(0)^2 = 0$
6	6 – 6 = 0	$(0)^2 = 0$
		Total: 0

Mean: 6
Median: 6
Range: 0

Divide the total on the (Data - Mean)^2 column by n – 1 (*n: is the sample size*)

$$\frac{0}{5-1} = \frac{0}{4} = 0$$

Take the square root of the result above that equals standard deviation

$\sqrt{0} \approx 0$

3d.

Data: x	Data – Mean: x - x̄	(Data - Mean)^2 : (x - x̄)^2
47	47 – 43.3 = 3.7	$(3.7)^2 = 12.69$
45	45 – 43.3 = 1.7	$(1.7)^2 = 2.89$
24	24 – 43.3 = -19.3	$(-19.3)^2 = 372.49$
56	56 – 43.3 = 12.7	$(12.7)^2 = 161.29$
76	76 – 43.3 = 32.7	$(32.7)^2 = 1069.29$
12	12 – 43.3 = -31.3	$(-31.3)^2 = 979.69$
		Total:

Mean: 43.3
Median: 46
Range: 64

Divide the total on the (Data - Mean)^2 column by n – 1 (*n: is the sample size*)

$$\frac{2598.34}{6-1} = \frac{2598.34}{5} = 519.668$$

Take the square root of the result above that equals standard deviation

$\sqrt{519.668} \approx 22.8$

4. a. mode
   b. mean
   c. median
   d. mean

5. a. mean 4.57, median 4, mode 4
   b. only the mean is affected; it becomes 5

6. The $1000 increase results in a $1000 increase in the mean but the s remains the same since the spread of salaries does not change. The 3% increase causes a 3% increase in the mean <u>and</u> in the s since the spread is now wider from top to bottom salaries.

7. First State has more consistent service because its standard deviation is lower meaning there is less variation in waiting times.