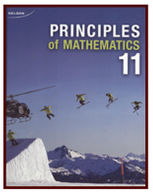
Strengthening and Conditioning

Lesson 6.1: Distributions and Standard Deviation



Refer to *Principles of Mathematics 11* pages 240, 250, and 261 for more examples.

- Page 240, #2 and 3
- Page 250, #2, 3, 4, and 5
- Pages 261, #3, 4, 5, and 11

Question 2, page 240

a.

	Unit 1 Test	Unit 2 Test
mean	71.2	71.2
median	73	73
mode	73	73
range	24	61

b. The mean, median, and mode are the same between the tests so neither set of scores is necessarily better. The larger range of the Unit 2 Test suggests that more students did very well or very poorly on that test.

c. The modes are the same and so do not provide any information to compare the two tests.

Question 3, page 240

a.

	1996	1998	2000
mean	163 440	176 937	187 434
median	157 667	167 396	172 503
range	95 567	127 616	98 952

All three sets of data had a variety of values above and below the mean and median. Both the mean and median suggest that prices rose between 1996 and 1998 and again between 1998 and 2000. The range suggests the spread of prices was largest in 1998.

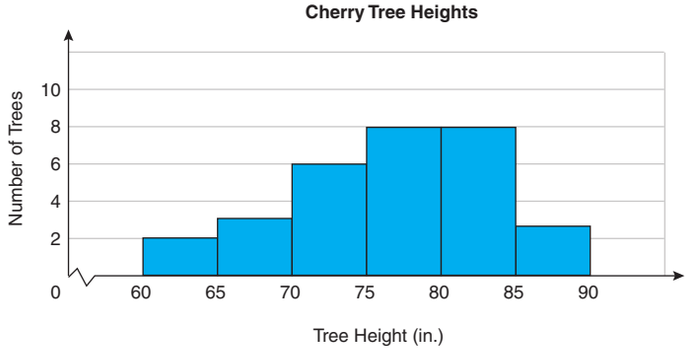
b. The data would be useful in comparing the housing prices between cities if you were thinking of moving to one of them.

Question 3, page 250

a.

Tree Height (in.)	Frequency
60 – 64	2
65 – 69	3
70 – 74	6
75 – 79	8
80 – 84	8
85 – 90	3

b.



c. The heights from 75 – 79 in. and 80 – 84 in. occur most often and the heights from 60 – 64 in. occur least often.

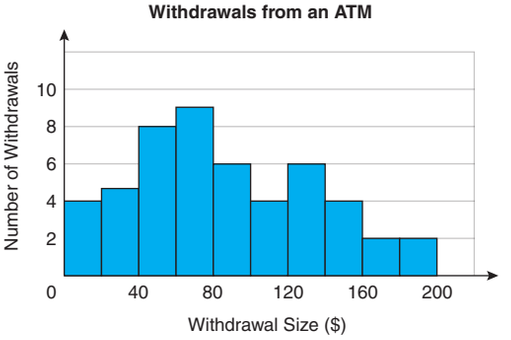
Question 4, page 250

a. Intervals of 20 would represent the data reasonably.

b.

Withdrawal size ($)	Frequency
1 – 20	4
21 – 40	5
41 – 60	8
61 – 80	9
81 – 100	6
101 – 120	4
121 – 140	6
141 – 160	4
161 – 180	2
181 – 200	2

c.



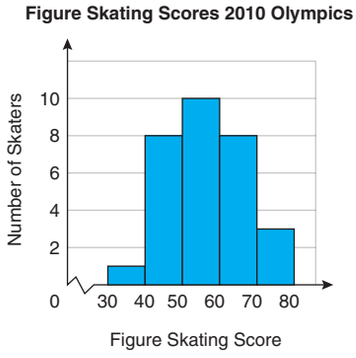
d. The most common withdrawal size was between 40 and 80 dollars, withdrawals less than
100 dollars were more common than withdrawals larger than 100.

Question 5, page 250

a.

Score	Frequency
30.00 – 39.99	1
40.00 – 49.99	8
50.00 – 59.99	10
60.00 – 69.99	8
70.00 – 79.99	3

b.



c. Yes, it gives an idea of the top 5 scores. The histogram shows that the top 5 skaters all scored more than 60 points. No more detail is available from the histogram.

Question 2, page 261

Use technology to determine the mean and standard deviation.

$\mu = 130.42$
$\sigma = 11.51$

Question 3, page 261

a. The exact scores are not known, but using the middle value for each class will allow you to estimate the mean and standard deviation. The following frequency table shows the values used.

Value	Frequency
103	1
108	3
113	4
118	7
123	9
128	14
133	11
138	8
143	6
148	5
153	3
158	1

mean = 130.36
standard deviation = 12.05

b. Ali's mean is 130.42 and his standard deviation is 11.51. Ali's mean is almost exactly that of the team's and his standard deviation is very close to that of the team's. Ali's performance is very similar to the team's overall performance.

Question 4, page 261

a. Company B has a larger standard deviation, so there is a larger variation in the masses of the bead packages. Compared to Company A, it is more likely that Company B would send a package with a mass that is much different than what was advertised.

b. Company A's masses are more consistent, so Marie is more likely to receive the expected mass of beads from Company A.

Question 5, page 261

a.

	Group 1	Group 2	Group 3	Group 4
μ	71.9	71.0	70.4	76.9
σ	6.0	4.0	5.7	1.9

b. Group 3 has the lowest mean pulse rate. Group 4 has the most consistent pulse rate because they have the lowest standard deviation.

Question 11, page 263

The actual number of daily calls is not given so use the middle value for each class to estimate the mean and standard deviation. The table below shows the values used to calculate the mean and standard deviation

Daily Calls	Frequency
28	2
33	13
38	42
43	53
48	42
53	36
58	8
63	4

The mean is approximately 45 and the standard deviation is approximately 7.1. The high standard deviation means there will be some days that have too many calls for the employees to handle. The employer should hire more employees.