Statistical Reasoning
Box and Whisker Plots

Name: _Key_   Date: _____   Class: _____

Find the 5 number summary and interquartile range for each set of data.

1. {4, 1, 3, 7, 7, 5, 4, 1, 8, 20, 2, 11, 7, 7, 1}

min	Q1	med	Q3	max	IQR
1	2	5	7	20	7-2 = 5

2. {1055, 1075, 1095, 1125, 1005, 975, 1123, 1100, 1145, 1025, 1075}

min	Q1	med	Q3	max	IQR
975	1025	1075	1123	1145	1123-1025 = 98

3. Find any outliers for the set of data in #1.

$Q3 + 1.5(5) = 7 + 7.5 = 14.5$
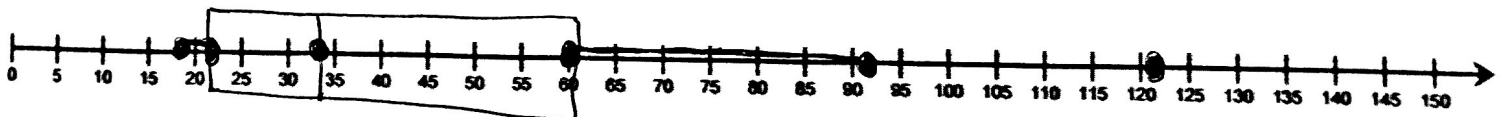
$Q1 - 1.5(5) = 2 - 7.5 = -5.5$

Outliers
20

4. Find any outliers for the set of data in #2.

$Q3 + 1.5(98) = 1123 + 147 = 1270$

$Q1 - 1.5(98) = 1025 - 147 = 878$

Outliers
None

5. The sales of the 15 largest American businesses are given below. Identify any outliers and make a box-and-whisker plot of the data.

Company	Sales (in billions)	Company	Sales (in billions)
Amoco	21	IBM	60
Chevron	25	Mobil	48
Chrysler	35	Occidental Petroleum	19
Du Pont	33	Phillip Morris	26
Exxon	80	Proctor and Gamble	19
Ford Motor	92	Shell Oil	21
General Electric	49	Texaco	34
General Motors	121 outlier		

min	Q1	med	Q3	max	
19	21	34	60	121	IQR = 60-21 = 39

$Q3 + 1.5(39) = 60 + 58.5 = 118.5$

$Q1 - 1.5(39) = 21 - 58.5 = -37.5$

6. The number of calories in a regular serving of French fries at different restaurants are listed below. Identify any outliers and make a box-and-whisker plot of the data.
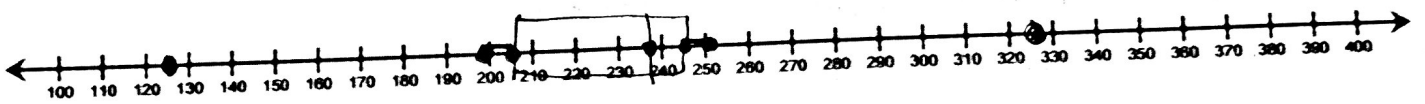
Restaurant	Calories	Restaurant	Calories
Burger Chef	250	Hardee's	239
Burger King	240	McDonald's	211
Carl's Jr.	220	Roy Rogers	240
Dairy Queen	200	Wendy's	(327) outlier
Friendly's	(125) outlier		

$$\begin{array}{ccccc} \text{min} & Q1 & \text{med} & Q3 & \text{max} \\ 125 & 205.5 & 239 & 245 & 327 \end{array}$$

$IQR = 245 - 205.5 = 39.5$

$Q3 + 1.5(39.5) = 245 + 59.25 = 304.25$

$Q1 - 1.5(39.5) = 205.5 - 59.25 = 146.25$

7. The table below shows the median ages of men and women at the time of their first marriage for the decades of 1890 through 1990. Identify any outliers and make a box-and-whisker plot of the data.

Year	Men	Women	Year	Men	Women
1890	26.1	22.0	1950	22.8	20.3
1900	25.9	21.9	1960	22.8	20.3
1910	25.1	21.6	1970	23.2	20.8
1920	24.6	21.2	1980	24.7	22.0
1930	24.3	21.3	1990	26.2	(25.1) outlier
1940	24.3	21.5			

Men

$$\begin{array}{ccccc} \text{min} & Q1 & \text{med} & Q3 & \text{max} \\ 22.8 & | & 24.6 & | & 24.2 \\ & 23.2 & & 25.9 & \end{array}$$

$25.9 + 1.5(2.7) = 29.95$

$23.2 - 1.5(2.7) = 19.15$

Women

$$\begin{array}{ccccc} \text{min} & Q1 & \text{med} & Q3 & \text{max} \\ 20.3 & 20.8 & 21.5 & 22 & 25.1 \end{array}$$

$22 + 1.5(1.2) = 23.8$

$20.8 - 1.5(1.2) = 19$