1.3 Homework part 2
87−97 odd, 109, 111

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87. (a) $\frac{86+84+91+75+78+80+74+87+76+96+82+90+98+93}{14} = 85$ points
    (b) $\frac{86+84+91+75+78+80+74+87+76+96+82+90+98+93+0}{15} = 79.\bar{3}$ points. This demonstrates the non-resistant characteristics of the mean (or that it can be influenced easily by outliers).

89. (a) $\{74, 75, 76, 78, 80, 82, 84, 86, 87, 90, 91, 93, 96, 98\} \rightarrow \frac{84+86}{2} = 85$ points
    (b) $\{0, 74, 75, 76, 78, 80, 82, 84, 86, 87, 90, 91, 93, 96, 98\} \rightarrow 84$ points. The median is resistant to outliers, which means that the absence has very little influence over the grade.

91. (a) The median is 8
    (b) Because of the outlier, the mean is most likely much greater than the median
    (c) Because it describes the 50 states (and District of Columbia), it must be a parameter

93. The mean is most likely \$276,200, while the median is probably \$234,200. House prices are most likely to have expensive/high outliers, which, due to the non-resistant nature of the mean, makes the mean significantly greater than the median.

95. (a) Because this distribution has an even number of terms, the average of the 37^{th} and 38^{th} terms is the median. According to the histogram, this is equal to 2.
    (b) $\bar{x} = \frac{11+30+33+32+25+18+21+24}{74} = 2.62$

97. (a) Before: $98 - 74 = 24$ points; After: $98 - 0 = 98$ points
    (b) Because range is non-resistant, it is a very poor measure of variability. Part (a) confirms this.

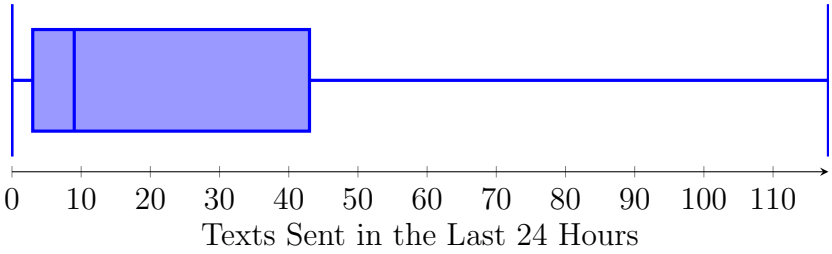
109. (a) Because of the difference between Q_3 and the max, this distribution is most likely skewed far to the right

(b) 21.70 means that, on average, each value in the distribution is 21.70 away from the mean

(c) $Q_3 - Q_1 = 26.13 \rightarrow Q_1 - 1.5(26.13) = -19.93$ and $Q_3 + 1.5(26.13) = 84.6 \rightarrow (-19.93, 84.6)$. Because the max is greater than the upper fence, there must be at least one outlier present in the data set

111. $\{0, 0, 0, 1, 1, 3, 3, 5, 5, 7, 8, 8, 9, 14, 25, 25, 26, 29, 42, 44, 52, 72, 92, 98, 118\} \rightarrow \begin{cases} \text{Min:} & 0 \\ Q_1: & 3 \\ \text{Med:} & 9 \\ Q_3: & 43 \\ \text{Max:} & 118 \end{cases}$

(a) Box Plot:



(b) The article is incorrect in its statements, as the third quartile is already less than the amount claimed in the article. This means that at least 75% of teenagers text less than stated in the article. Additionally, the maximum number is an outlier, meaning that, most likely, more than 75% of teenagers text less. In this manner, the article is incorrect