

Name: **Answers**

Per: _____

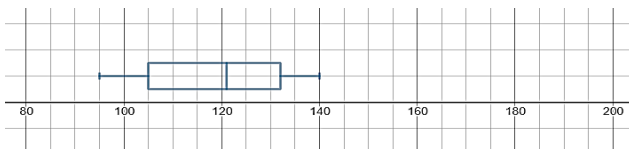
12.3/12.4 – Box Plots and Histograms Homework

For problems 1 and 2, make a box plot, state whether each distribution is negatively-skewed, positively-skewed, or symmetric, and state your findings about what the data/box plots show in real-life.

1. In 1954, the NBA adopted the 24-second shot clock. To help determine the effect the change had on the game, data concerning the number of shots, for both teams, taken in 10 games before the shot clock and the number of shots taken in 10 games after the shot clock is shared below.

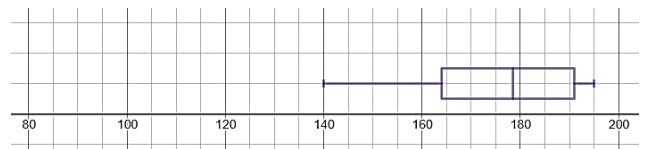
Number of shots per game before shot clock

95, 102, 105, 110, 118, 124, 130, 132, 135, 140



Number of shots per game after shot clock

140, 155, 164, 170, 178, 179, 180, 191, 192, 195



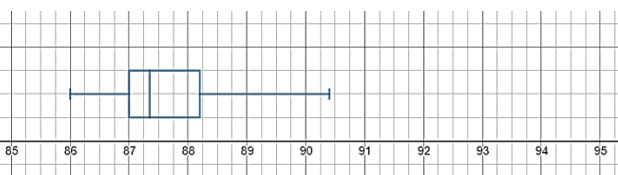
Distribution type for each: **Before the shot clock it was fairly symmetric and after the shot clock it is slightly negatively skewed since the left whisker is much longer than the right.**

Findings: **After the shot clock the number of shots per game increased noticeably (median before was 121 and median after was 178.5).**

2. In previous studies, researchers observed that women tend to have a higher core temperature than men by about 1/2 degree. However, a nurse noticed that women consistently complained about cold hands. To test this, she sampled 10 women and 10 men and compared their hand temperatures. Construct a box plot for each and answer the questions below.

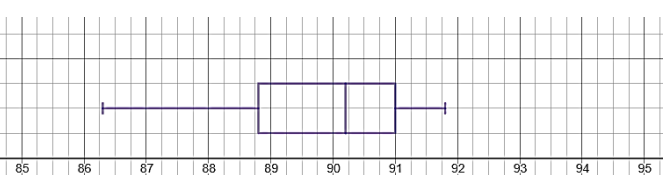
Hand temperatures for women (degrees Fahrenheit)

86, 86, 87, 87.2, 87.3, 87.4, 87.6, 88.2, 89.8, 90.4



Hand temperatures for men (degrees Fahrenheit)

86.3, 88, 88.8, 89, 90.1, 90.3, 90.9, 91, 91.3, 91.8

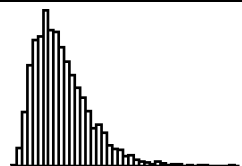


Distribution type for each: **The women's distribution is slightly positively skewed and the men's is slightly negatively skewed.**

Findings: **Men tend to have a higher hand temperature than women as seen by the general location of both boxplots and the fact the men's median was 90.2 and the women's was 87.4.**

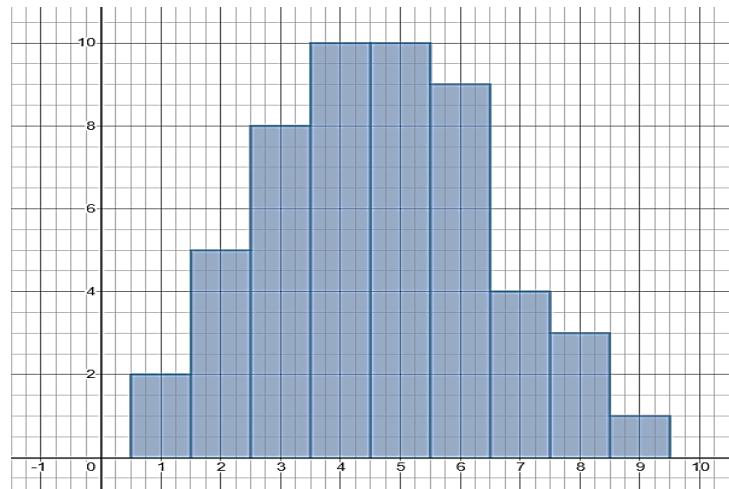
3. A histogram for the prices of houses in a Helena is shown. Would it be better to describe the center and spread using the **mean and standard deviation** or **five-number summary**? Explain your choice.

Due to the fact that there is significant positive skewness that would make the mean higher, it would be best to use the five-number summary since it uses the median, which is not as affected by skewness or outliers.



4. To test how long their customers had to wait on hold during a phone call, a company surveyed some of its customers and recorded the number of minutes they had to wait below. Make a histogram and answer the questions.

Minutes on Hold	# of Customers
1	2
2	5
3	8
4	10
5	10
6	9
7	4
8	3
9	1



a) What type of distribution does this make (symmetric or skewed)?

This is a symmetric distribution.

b) Should the mean and median be similar or different for this data set? Explain how you know.

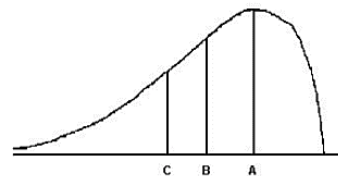
Since it is a symmetric distribution, the mean and median should be similar. If you calculate them, you will see the mean = 4.6 and the median = 5.

5. For the distribution shown, state which one is the mean, median, and mode.

Mean : **C**

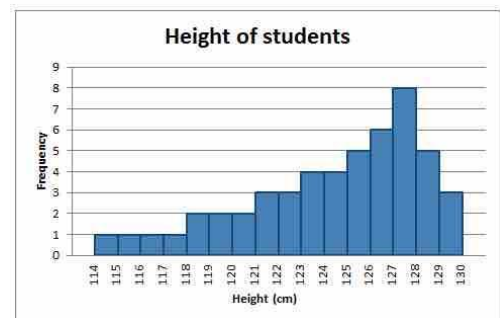
Median: **B**

Mode: **A**



6. Based on the distribution of student heights shown, would the mean be below, exactly at, or above 127.5 cm? Explain your decision.

Because the distribution is negatively skewed, all those lower values will bring the mean down below the peak (mode) at 127.5. So, the mean will be below 127.5 cm.



7. Come up with with your own scenario (one not in the notes or this worksheet) whose distribution would be positively skewed.

An example of a distribution that would be positively skewed would be wealth of people in a country. It has its natural boundary at zero. Also, there are fewer and fewer people with huge wealth. So, it would look like the following.

