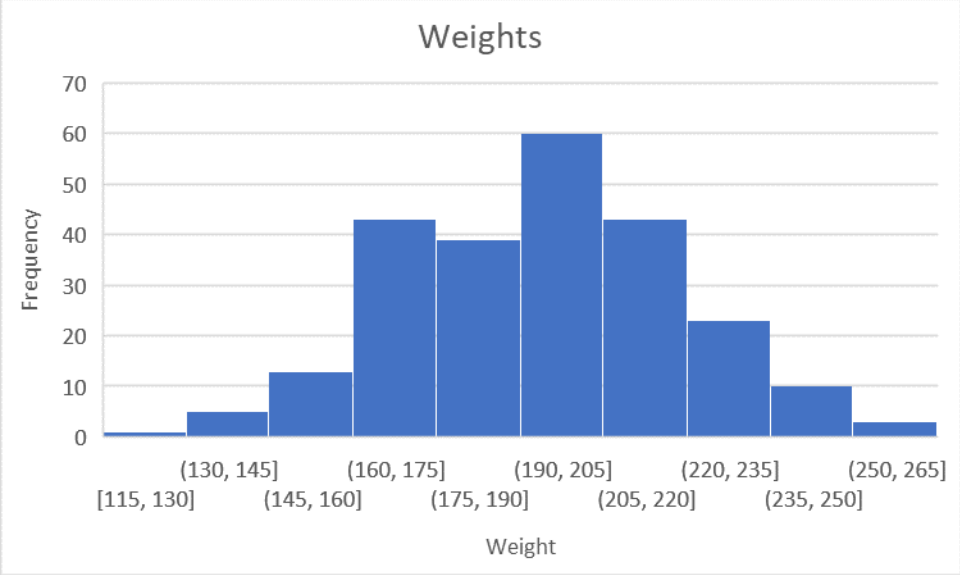
MATH 154, Exam #2, Part II, Spring 2019 Name _____

**Instructions**: This portion of the exam is to be answered entirely in class without Excel. You may use a calculator, but it may not be on a device that connects to the Internet. Round answers to two decimal places unless the question asks for a different number of places.

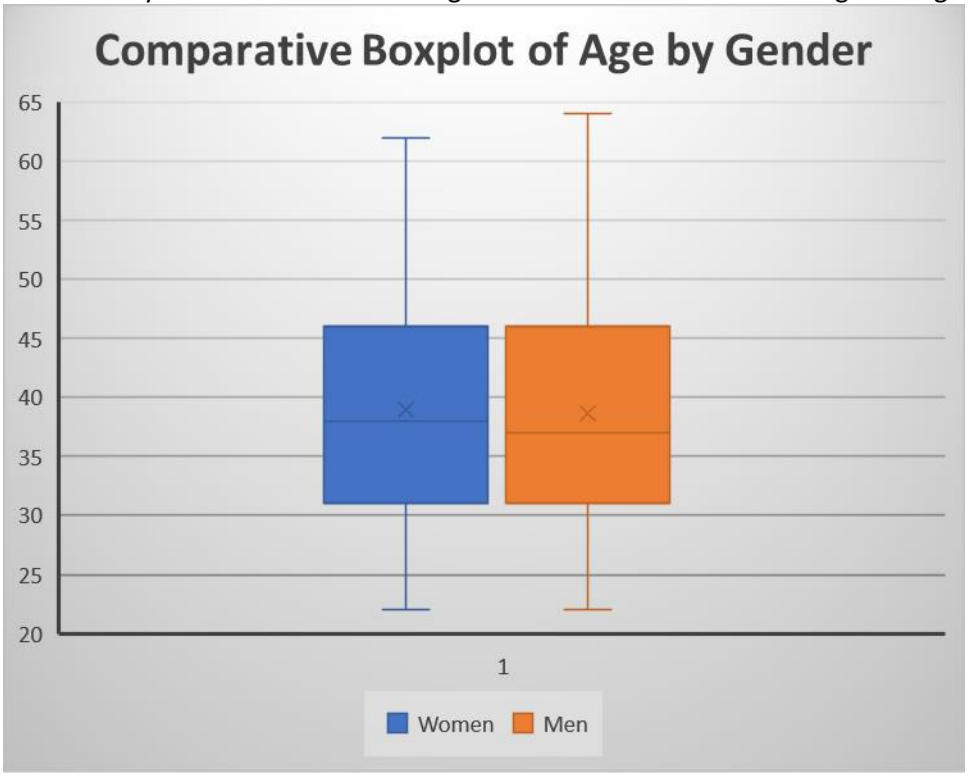
1. What does it indicate for the skewness of a histogram if the mean is lower than the median? (3 points)

2. A sample of 240 people is taken and their weights measured. A histogram of the data is shown below. Based on the graph, describe the shape of the distribution, and state the modal class. (6 points)




3. A 1/6 scale model of a house made of a revolutionary plastic uses 0.51 cubic meters of the new material. How much of the new material is needed for the full-size structure if the plastic is used for all of the same elements as in the model? (6 points)

4. A boxplot comparing the ages of men and women in a sample is shown. Describe any differences you notice between the ages of men and women according to the graph. (5 points)




5. A table of unit conversions is shown below. Use it to perform the following unit conversions. (4 points each)

**Length**

*SI unit : meter (m)*

1 km = 0.62137 mi
1 mi = 5280 ft
= 1.6093 km
1 m = 1.0936 yd
1 in = 2.54 cm (exactly)
1 cm = 0.3937 in

**Temperature**

*SI unit : kelvin (K)*

0 K = -273.15°C
= -459.67°F
K = °C + 273.15

$$°C = \frac{5}{9}(°F - 32°)$$

$$°F = \frac{9}{5}°C + 32°$$

a. Convert 927 miles to kilometers

b. Convert 927 miles to inches

c. Convert $141°F$ to degrees Celsius

6. The standard score for Aleyah's temperature test is $z = -2.3$. If the mean of the test is $97.4°\text{F}$ and has a standard deviation of $0.5°\text{F}$. The observation value can be found by rearranging the standard score equation to be $x = \mu + z\sigma$. What is Aleyah's temperature according to the test? (5 points)

7. A screenshot below shows a small dataset, sample size 10. Based on the information shown, write the Excel formulas you'd need to calculate the requested values. (4 points each)

| | AF | AG | AH | AI | AJ | AK |
|---|---|---|---|---|---|---|
| 1 | | 20 | | | | |
| 2 | | 22 | | | | |
| 3 | | 26 | | | | |
| 4 | | 23 | | | | |
| 5 | | 24 | | | | |
| 6 | | 18 | | | | |
| 7 | | 32 | | | | |
| 8 | | 24 | | | | |
| 9 | | 31 | | | | |
| 10 | | 28 | | | | |
| 11 | | | | | | |

a. What formula would be needed to find the mean of the data?

b. What formula would be needed to find the sample standard deviation?

c. What formula would be needed to find the population standard deviation?

8. When a standard deviation value is requested and the problem does not specify whether to calculate the sample or population standard deviation, which one should you assume? (3 points)

9. A probability distribution is shown below. Use it to answer the questions that follow. (3 points each)

| **x** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
|---|---|---|---|---|---|---|---|---|
| $p(x)$ | 4% | 11% | 31% | 8% | 19% | 11% | 9% | 7% |

a. $P(x = 3)$

b. $P(x < 2)$

c. $P(x \geq 5)$

d. $P(3 < x < 6)$

e. $P(x < 0)$

f. $P(x \leq 1 \; OR \; x \geq 6)$

10. Three coins are flipped and the outcome of each flip is recorded as either H or T. What are all the possible outcomes of the three flips? (6 points)