**Math Analysis Honors**

**Unit 14 Stat WS 1**

**Do all work neatly on a separate piece of paper.**

1. **Describe the shape of each of the distributions you constructed for Day 1.**
2. **The following data show the salaries (in thousands of dollars) of 28 employees of a small company:**

**(Note: Data is the same as Day 1, # 4)**

**30, 33, 35, 41, 42, 45, 45, 50, 52, 53, 55, 57, 60, 60, 61, 62, 63, 65, 67, 70, 71, 72, 73, 98, 105, 125, 150, 175**

1. **What are the mean and median salaries? Which one is a better measure of center? Why?**
2. **Find the range and IQR of the data. Which one is a better measure of the spread of the data? Why?**
3. **Find the standard deviation.**
4. **Use the 1.5 IQR rule to determine if the data has any outliers.**
5. **Draw a box plot of the data showing outliers (if present).**
6. **Use the formula  to calculate the standard deviation of 0, 2, 5, 8, 10. What does this value tell you about the data?**
7. **The heights of a random sample of 19 men are recorded below:**

**69.9, 71.8, 72.1, 73.1, 73.8, 70.6, 69.4, 69.6, 76.2, 71.8, 74.6, 66.9, 69.1, 66.7, 70.4, 71.8, 69.3, 72.3, 71.5**

1. **Use your calculator to construct a histogram of the data. Use class interval widths of 2 inches.**
2. **Describe the shape of the distribution.**
3. **Find the mean, median, and mode (class interval with the highest frequency). What do you notice about the three measures of center?**
4. **Construct a box plot for the data. Are there any outliers?**
5. **What interval of heights contains the middle 50% of the men?**
6. **What height interval contains the shortest 25% of the men? The tallest 25%?**
7. **A student randomly guesses the answer for each question of a 6-question True/False exam.**

**(Note: You constructed the probability distribution on Day 1, Q #1)**

1. **Enter the numerical values of the sample space into L1 of your calculator. Enter the probability of each outcome into L2.**
2. **To have your calculator construct the probability histogram, press 2nd STAT PLOT 1: PLOT 1…On. Choose the histogram. Set Xlist: L1 and Freq: L2. (This allows the probabilities in L2 to be used as frequencies). Use the same window as you used for the graph yesterday. Is the calculator’s graph the same as yours?**
3. **Follow these instructions carefully: Press STAT CALC 1-Var Stats ENTER L1, L2 ENTER . (The calculator will know to use the values in L2 as frequencies for L1). What is the mean of the distribution? Is it the same as the expected value you found yesterday?**
4. **Does the calculator report a sample standard deviation? For a probability distribution, the calculator provides the population standard deviation . What is this value?**

1. **Report Q1, Median, and Q3 for the distribution.**
2. **Use your calculator to construct a box plot.**

**Answer Key:**

**1. 1: Symmetric**

 **2: Uniform**

 **3: Uniform**

 **4: Skewed right**

 **5: Bimodal**

**2 a. Mean: 68.3929 Median: 60.5**

 **Median is better because it better disregards the extreme outliers.**

 **b. Range: 145 IQR: 24**

 **IQR is better because it uses the median, which disregards outliers.**

 **c. Standard Deviation: 34.0504**

 **d.  and . So 125, 150, and 175 are outliers.**

**30

45

60

75

90

105

120

150

135

165

180

125

150

175

 e.**

**3 **

664

66

70

68

2

4

72

74

76

78

80

**4 a.**

 **b. The shape is normal with a very slight positive skewing.**

 **c. Mean: 71.1 Median: 71.5 Mode: **

 **The three measures of central tendency are all at about the same spot.**

**64

66

70

68

72

74

76

78

80

**4 d.

 There are no outliers

 e. The middle 50% of the heights are found between 69.4 and 72.3

 f. The shortest 25% are from 66.7-69.4. The tallest 25% are from 72.3-76.2

5 a. Done.

1

2

3

5

4

6

7

0

0.1

0.2

0.3

0.4

 b.

 c. The median is 3, the same as the expected value.

 d. There is no sample standard deviation, but 

1

2

3

5

4

6

7

0

 e.   

 f.