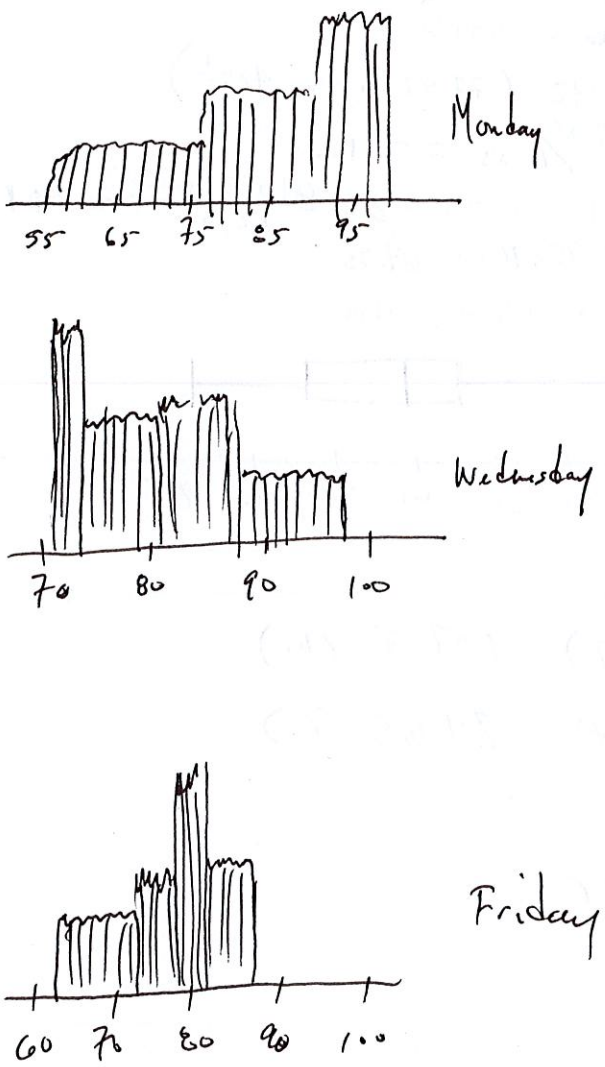
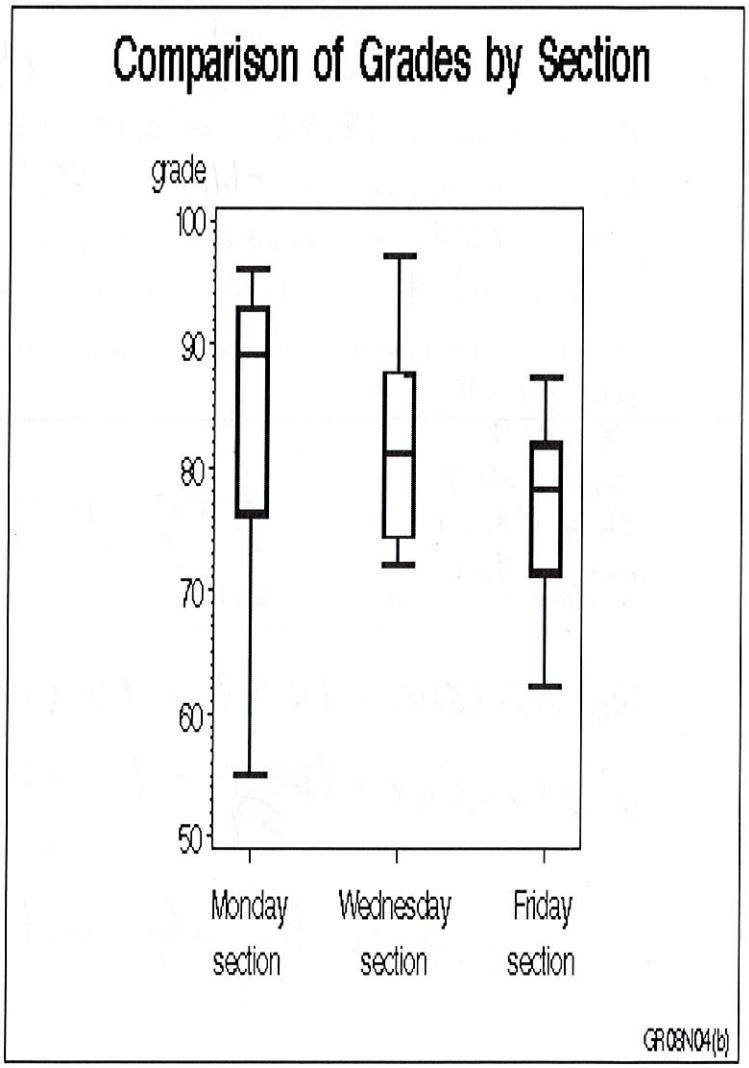
Math 175 – Spring 2018
G4 & Exam Review

Due: In class today

Names: Solutions Assignment:

(1) For the vertical boxplots shown below, draw three histograms that *roughly* show the three distributions.





(2) Circle the best description of each of the three distributions' shapes from the boxplots above.

Monday:	(Skewed Left)	Symmetric	Skewed Right
Wednesday:	Skewed Left	Symmetric	(Skewed Right)
Friday:	Skewed Left	(Symmetric)	Skewed Right

(3) For this dataset of Math 175 final exam scores . . .

6.8	51.95	61.1	66.23	70.13	76.62	85.71
40.25	53.25	62.5	66.23	70.89	77.92	86.1
41	53.25	63.64	66.7	71	79.22	87.01
44.68	54.2	63.64	66.7	72.73	80.52	89.61
45.8	54.55	63.64	66.7	73.6	81.82	90.3
49.35	58.3	63.9	68.83	74.03	81.82	93.1
50	59.7	63.9	69.4	76.4	83.3	93.1
51.15	61.1	64.94	69.4	76.62	84.42	93.1
		Mean	**67.35**			
		Standard Deviation	**16.03**			

a. The student's score of 64.94 is the 41st percentile. ($\frac{23}{56} \approx 0.411$)

b. The 75th percentile is 77.92. $\leftarrow 0.75 \times 56 = 42$ (77.92 is the 42nd)

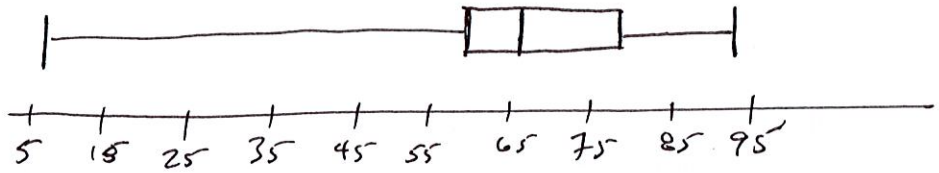
c. The z-score for the value 49.35 is -1.12. $\leftarrow \frac{49.35 - 67.35}{16.03} = -1.12$

d. 64.94 is 15% of a standard deviation from the mean (percentage). $\leftarrow z = \frac{64.94 - 67.35}{16.03} \approx -0.15$

e. A score of 163.4 would have a z-score of 2.25. $\leftarrow 2.25 \times 16.03 + 67.35$

f. Find the 5-Number Summary and draw a boxplot for the data set in the space below.

min = 6.8
Q_1 = 59
Q_2 = 66.7
Q_3 = 78.57
max = 93.1



g. Determine which, if any, of the data in this set are outliers.

$Q_3 + 1.5 \times IQR = 78.57 + 1.5(19.57) = 107.9$ (hi)

$Q_1 - 1.5 \times IQR = 59 - 1.5(19.57) = 29.65$ (lo)

6.8 is the only outlier.

(4) True or False (circle):

a. In an experimental study, the control group is the group with no changes made to the independent variable — (TRUE) FALSE

b. If N is even, then Q2 is an actual data point. — TRUE (FALSE)

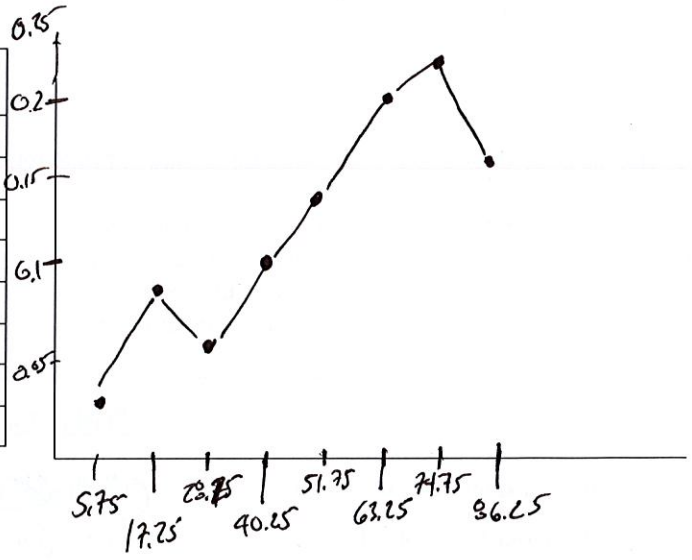
c. In a distribution of z-scores, the mean is 1 and standard deviation is 0. — TRUE (FALSE)

d. The median is the middle number in a dataset. — (TRUE) FALSE

e. $\bar{x}$ is the symbol used for population mean — TRUE (FALSE)

Fill in the midpoints and relative frequency values in the table below and draw a relative frequency polygon next to it.

Boundaries		Midpoint	Frequency	Cumulative Frequency	Relative Frequency
0	11.5	5.75	2	2	0.027
11.5	23	17.25	6	8	0.082
23	34.5	28.75	4	12	0.055
34.5	46	40.25	8	20	0.110
46	57.5	51.75	10	30	0.137
57.5	69	63.25	15	45	0.205
69	80.5	74.75	16	61	0.219
80.5	92	86.25	12	73	0.164



What is the shape of the frequency distribution above? (circle one)

Normal *Uniform* *Bimodal* *Skewed Left* *Skewed Right*

either one works.

In order to determine how a new fertilizer affects people's preference for kale, a statewide sample of farmers were given the fertilizer and told to use it on half of their kale fields. They were told to keep the other kale fields fertilizer-free. After harvest, both versions of kale were sent to various markets and given out as samples. The number of samples taken of each variety was tracked at the markets. Researchers determined that because there was little difference in the number of samples given out, the effect of the fertilizer on the flavor of the kale is negligible.

What type of study is this? (circle one) OBSERVATIONAL (EXPERIMENTAL)

What is the dependent variable? # of samples taken (flavor)

What is the independent variable? fertilizer (or not)

List two possible confounding variables.

weather, rain, temp, location, . . .

Classify each of those variables by circling the appropriate term in each category below.

Key:		
	Qual = Qualitative	N = Nominal
	Quant = Quantitative	O = Ordinal
	Disc = Discrete	I = Interval
	Cont = Continuous	R = Ratio

	Qual or Quant?	Disc or Cont?	Level of Measurement
Independent variable above	(Qual) – ~~Quant~~	(Disc) – Cont	(N) – O – I – ~~R~~
Dependent variable above	Qual – (Quant)	(Disc) – Cont	N – O – I – (R)
varies 1st confounding variable above	Qual – Quant	Disc – Cont	N – O – I – R
varies 2nd confounding variable above	Qual – Quant	Disc – Cont	N – O – I – R
Hair Color	(Qual) – Quant	(Disc) – Cont * could be cont	(N) – O – I – R
T-shirt size	(Qual) – Quant	(Disc) – Cont	N – (O) – I – R
Calories consumed at breakfast	Qual – (Quant)	Disc – (Cont)	N – O – I – (R)
Religion	(Qual) – Quant	(Disc) – Cont	(N) – O – I – R