MATH 217
Exam I
Key

1) (21 points)
a) Stemplot

1| 1 1 3 4 5 5 6 8 8 9
2| 1 2 3 3 9
3| 0 1 3 8
4| 2 2 5
5| 8
6| 5

b) The data is highly skewed to the right.

c) We would want to use the 5-Number summary because the mean and standard deviation are not recommended for non-symmetric distributions.

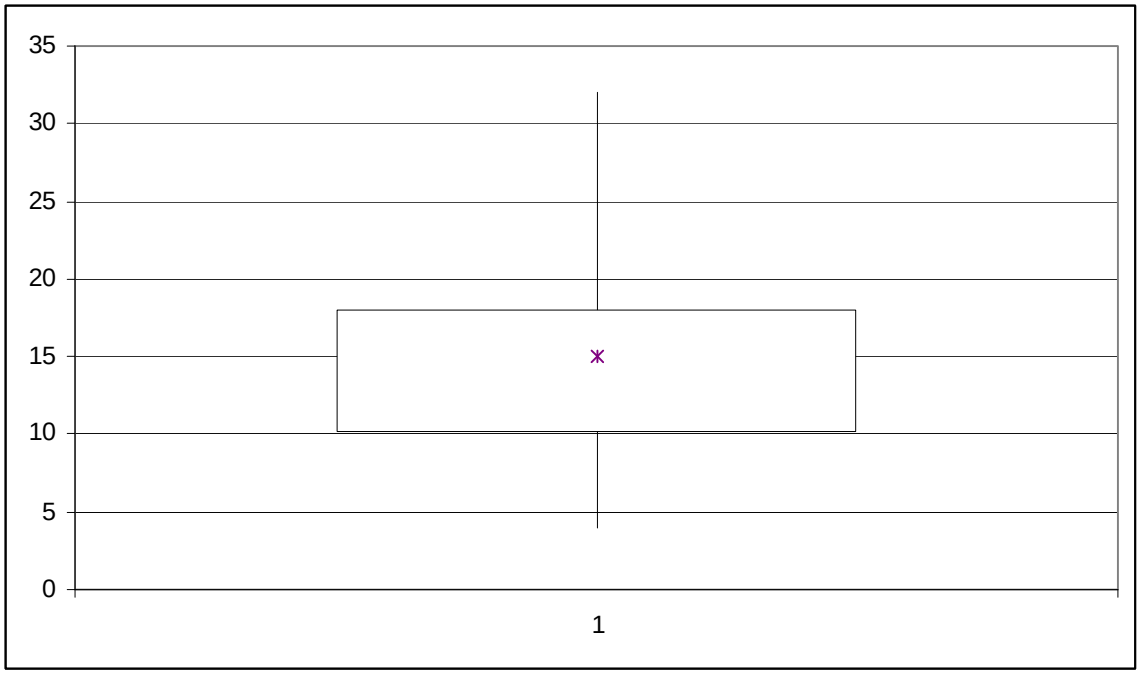
2) (12 points)

a) The mean is 27.16 and the median is 22.5.

b) The mean is higher than the median. This is not surprising since the distribution is skewed to the right. *(Other answers valid depending on reasoning.)*

3) (12 points)
If a distribution is skewed to the left we should expect that the mean will be less than the median as it is pulled to the left.

4) (12 points)
The box plot appears below.



To find out if there are any outliers we perform the (1.5)X(IQR) test. The interquartile range is Q3-Q1=18-10=8. So (1.5)X(IQR)=1.5X8=12. Hence, any points falling BELOW Q1-12=10-12=-2 or ABOVE Q3+12=18+12=30 are possible outliers. Since no points fall below -2 there are no lower outliers. However, the maximum value of 32 is greater than 30 implying that 32 could be an outlier.

5) (18 points)

Pot-bellied pigs are N(90, 6).

- **a)** To find out the % above 93 we standardize 93 and use the z-table. The z-score for 93 is (93-90)/6=0.5. On the table we see that 0.5 corresponds to 0.6915. Hence, 69.15% of pot-bellied pigs weigh less than 93 lbs, leaving 100-69.15=**30.75%** weigh more.
- **b)** There are two ways to find the % between 84 and 90. If you noticed that 84 is exactly 1 standard deviation below the mean you can use the 68-95-99.7 rule. This says 68% of the pigs weigh between 84 and 96lbs. Hence, one half of those lie between 84 and 90. So **34%.** Alternately, you could standardize both scores and get the area between using the z-table.

6) (10 points)

The numbers in Table B are all pretty closely clumped around the 20's. In Table A the values range from 10 to 65. **Table A will have the higher standard deviation.**

7) (15 points)

a) The slope of this line is 2. This tells us that the weight of the pig increases for 2 lbs for every additional inch of ear length. (NOTE: We are not talking about increasing the ear length of an individual pig, rather we are talking about comparing multiple pigs with varying ear lengths.)

b) A pig with 5 inch ears should weigh 86+2(5)=**96 lbs.**

c) The correlation coefficient being .15 is not good. It tells us that there is a positive relation between pig ear lengths and weight (the longer the ears, the heavier the pig) but the correlation is very low. In general, this equation will not be a good predictor. (Remember, the closer to 0 the closer to NO correlation. We want our correlation coefficient to be reasonably close to +/-1.)

BONUS

1) The pig weighs more than 88% of its fellow pigs. This corresponds to a z-score of approximately 1.18. Hence, 1.18=[(Pigs Weight)-90]/6. Solving this gives the pigs weight as approximately 97.08lbs.

2) Standardizing both scores gives you a z-score of (78-64)/7=2 and your friend a z-score of (80-71)/7.3=1.23. Hence, you were 2 standard deviations above the average and your friend was "only" 1.23 above. You win.