MATH 2625, Final Review.   Name _____

1. For the following measures: 2, 4, 9, 3, 7, 3 find the following statistics.

    sample mean =

    sample median =

    sample mode =

    sample variance =

    sample standard deviation =
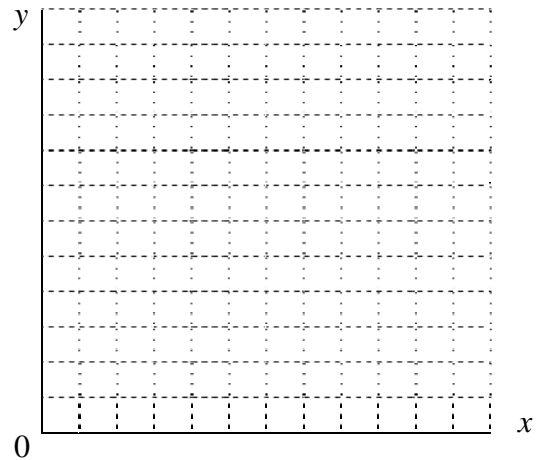
    85th percentile =

2. Use the following data to make a stemplot:
              6, 39, 14, 25, 46, 36, 38, 43, 91, 48, 58, 56, 38, 40

3. The average GPA at Alan's school has a mean of 3.2 and standard deviation of .2. If Alan's GPA
    has a z-score (or standard score) of 3 from his school, what is the Alan's actual GPA?

4. Suppose that the mean and the standard deviation of body fat percentage of certain ethnic group
    of people is mean = 22 and standard deviation = 2. If we assume that the distribution of
    percentage fat is normally distributed,
    a) what proportion of the people of this ethnic group will have fat percentage below 20 percent?

    b) what is the 75th percentile?

5. The reading scores of 10 randomly selected 12th grade students from a high school were
    recorded. The mean of this sample mean 8.2 and the sample standard deviation is 1.1. Find the
    95% confidence interval estimate for the average reading score for the 8th grade students in this
    high School, assuming the data was from a normally distributed population.

6. In a hypothesis testing problem, one obtained a p-value of 0.002 in testing whether the average
    weight for certain population is different from 120 pounds.
    a. State the null hypothesis:

    b. State the alternative hypothesis:

    c. If one uses the level of significance at 0.05 to test the hypothesis, what would be the
        conclusion?

7. A research wish to test whether **the average weight of newborn healthy babies is less than 7
    lb** or not. A random sample of 81 healthy new born babies were selected and yielded a mean of
    6.5 lb and a standard deviation of .9 lb. Test the hypothesis at the level of significance of 0.05.

8. In an investigation, a group people was randomly selected and examined to see if they are
    infected with disease W in a population. Out of 1000 randomly selected people from this
    population, 80 of them were tested positive. Estimate the proportion of people in this population
    are infected with disease W. Use a 95% confidence interval.

9. Make a scatter plot using the following data to examine the correlation between the two variables, *length of hospital stay after surgery* (in days) and *the recovery condition* (recovery score, is a 0 - 12 scale with 12 as best and 0 as worst recovery) one month later, and comment on the correlation. Is there a positive or negative correlation?

Patient ID	Length of hospital stay, x (in days)	Recovery condition, y (recovery score)
1	3	6
2	4	9
3	2	5
4	4	7
5	5	10
6	6	11

10. The heights (x, in inches) and weights (y, in pounds) of middle school male students were recorded and the correlation coefficient, means and standard deviations are calculated and they are: $r = 0.65, \bar{x} = 70, s_x = 8, \bar{y} = 126, s_y = 9$.
    a) Write the **linear regression equation** for **estimating average weight for middle school male student** using height variable.
    b) Which of the two variables in a) is the **explanatory variable**?
    c) Use equation in a) to estimate the average weight of student whose height is 65 inches.
    d) Interpret the meaning of the correlation coefficient, r, for having a value of 0.65.

11. To test whether there is strong correlation between gender and seatbelt wearing habit, 90 subjects were observed and the result was recorded in the following table. At $\alpha = 0.05$, can you conclude that there is strong correlation between gender and seatbelt wearing habit?

	Always Wear Seatbelt	Not Always Wear Seatbelt
Male	33	9
Female	46	4

12. Mary put $1,000.00 in an account that pays 5% simple interest till the maturity date that will be two years later. How much interest will she earn in two years?

13. Doug has money in a checking account that pays 3% annual interest rate and compounding monthly. What is the effective annual rate?

14. If one wishes to loan $50,000 for 10 year by making monthly payments that pays an interest rate of 2% compounded monthly. How much should the monthly payment be?

15. If one wishes to put a fix amount of money in a bank account for one year, which of the following account is better?
    a) An account that pays simple interest rate of 4%.
    b) An account in which the interest compounded semiannually with an annual rate of 4%.
    c) An account in which the interest compounded quarterly with an annual rate of 4%.
    d) An account in which the interest compounded monthly with an effective annual rate of 4%.