

MATHEMATICAL JOURNAL
WEEK 5 & 6

1. Jury pool consists of 14 men and 16 women. Twelve jurors are to be selected at random from the jury pool.
 - a. What is the probability that the jury is all male?
 - b. What is the probability that the jury is all female?
 - c. What is the probability that the jury is exactly half male?

2. A group of seven people enters a restaurant. Instead of waiting for a table, they decide to split up into a group of four and group of three. In how many different ways can they do this?

3. From the applicants for president of a college there are 10 semifinalists.
 - a. If members of the screening committee are asked to rank the 10 semifinalists, how many rankings are possible?
 - b. If only the top five are to be selected and ranked, how many lists are possible?
 - c. If the top five are to be selected but not ranked, how many lists are possible?

4. The probability that a 45-year-old male dies before his next birthday is 0.00218. If two 45-year-old males are selected at random, what is the probability of each of the following?
 - a. Both die before their next birthdays.
 - b. Neither of them die before their next birthdays.
 - c. At least one of them dies before his next birthday.

5. Suppose that a card is picked at random from a standard deck of 52 playing cards.
 - a. What is the probability that the card is a face card?
 - b. What is the probability that the card is a club or a 9?
 - c. What is the probability that the card is red given it's a face card?

6. The closing prices (in dollars) of 20 selected stocks listed on the New York Stock Exchange on a given day is shown.

3 16 75 77 52 41 36 39 23 1
6 24 33 7 26 39 45 54 63 55

- Construct a grouped frequency distribution for the data. Use the classes 0 – 9, 10-19, 20-29, 30-39, 40-49, 50-59, 60 – 69, and 70-69.
 - Construct a stem-and-leaf plot for the data set.
 - Construct a box-and-whisker plot for the data.
 - Determine the mean, media, and mode for the data set.
 - What is the standard deviation of the data?
7. Suppose a dog runs in front of a car traveling at a given rate of speed in meters per second. The car continues to cover distance while the driver reacts, and while he/she applies the brakes to stop the car. The following chart gives the original speed at which the driver was traveling, and then the reaction distance covered before the car comes to a stop.

Original Speed meters/sec	Reaction Distance meters
11	8
16	12
20	15
25	18
29	22

- What is the equation of the regression line that models this data?
 - What does the slope mean in terms of the problem given?
 - What is the x-intercept of the regression line? Explain what it means in terms of the context of the problem.
 - At what speed was the driver traveling (km/hr), if stopping the vehicle requires a reaction distance of 14 meters?.
 - If a car was traveling 85 km/hr, what is the total reaction distance needed by the driver?
8. Describe a situation that has each of the following characteristics.
- A situation in which there is a strong positive correlation.
 - A situation in which there is no correlation.
 - A situation in which there is a weak negative correlation.