Homework 1:

1. What is the probability that a card selected at random from a standard deck of 52 cards is an ace or a heart?
2. What is the probability that a positive integer not exceeding 100 selected at random is divisible by 5 or 7?
3. In a super lottery, players win a fortune if they choose the eight numbers selected by a computer from the positive integers not exceeding 100. What is the probability that a player wins this super lottery?
4. Suppose that 100 people enter a contest and that different winners are selected at random for first, second, and third prizes. What is the probability that Michelle wins one of these prizes if she is one of the contestants?
5. Which is more likely: rolling a total of 8 when two dice are rolled or rolling a total of 8 when three dice are rolled?
6. What is the conditional probability that exactly four heads appear when a fair coin is flipped five times, given that the first flip came up tails?

$$A = \begin{bmatrix} 2 & 2 & 0 \\ 5 & 0 & -2 \\ 0 & 3 & 0 \end{bmatrix}$$

Compute:

7. $A^T$
8. Trace(A)
9. Determinant(A)