1. Consider the experiment of choosing a hand of 4 cards from a standard deck of 52 playing cards. The cards are chosen one at a time with replacement.

(a) Determine the number of sequences.
Determine the number of sequences satisfying the following restrictions:
(b) None of the cards are spades.
(c) All 4 cards are spades.
(d) All 4 cards are the same suit.
(e) The first card is a king and the third card is not an ace.
(f) At least one of the cards is a spade.

2. Compute each of the following.
(a) \( P(n, n-1) = \)
(b) \( P(n, n-2) = \)
(c) \( P(n+1, n-1) = \)

3. Find the number of distinguishable permutations of the letters in ASSOCIATIVE.

4. Compute each of the following.
(a) \( C(n, n-1) = \)
(b) \( C(n, n-2) = \)
(c) \( C(n+1, n-1) = \)
5. A coin is flipped 10 times.
   (a) How many outcomes are possible?
   (b) How many outcomes has exactly three heads?
   (c) How many outcomes have at most three heads?

6. Find the numerical coefficient of $x^3y^5$ in the expansion of $(3x - 2y)^8$.

7. Expand the following expression and simplify the coefficients.
   $$(x - 2y)^4$$