SI 8: Recurrences and Combinatorics

1 Recurrences

1. Find the closed form of the following recurrence:

$$x_n = 6x_{n-1} - 9x_{n-2}$$
$$x_0 = 2$$
$$x_1 = 3$$

2. Find the family of polynomials functions with a function equivalent to:

$$f(n) = \frac{n}{2}\%4$$

   You do not need to solve for the constants $a_0, a_1, ..., a_n$

2 Counting Cards

3. In how many ways can you get a flush in a 5-card poker hand (all five cards of the same suit)?

4. A straight flush (all 5 cards of the same suit, and they form a straight)?

5. A royal flush (ten, joker, queen, king, ace, of the same suit)?

6. A full house (a two of a kind and a three of a kind)?