Spring 2023, Math 579: Preliminary Problem Set 1
Due: Thursday, January 26th, 2023
Binomial Theorem and Combinatorial Proofs

Preliminary problems. These problems should be completed before discussion on Thursday.

(P1) Determine how many 5-digit numbers are divisible by 5 and have middle digit 6.

(P2) Suppose you have a standard 52 card deck, with 4 suits (labeled spades, clubs, hearts, and diamonds) and 13 ranks (labeled 2 through 10, Jack, Queen, King, and Ace). Each card has one rank and one suit, and no two cards are identical.

    (a) How many possible 5 card hands are there?

    (b) Of the possible hands, how many do **not** consist of all the same suit?