Math 139 Solution
Quiz 4 14 March 2003

1. Two cards are drawn at random from an ordinary deck of 52 playing cards. Find the probability of the event "One of the cards is an ace and the other is a face card." (There are four aces and twelve face cards in the deck.)

   Solution: The experiment is drawing two cards from a deck. There are $C(52, 2) = 1326$ possible outcomes.

   The size of the event is the number of ways we can choose an ace (four) times the number of ways we can choose a face card (twelve). So there are 48 outcomes in the event.

   The probability of this event is $48/1326 \approx 3.62\%$.

2. An urn contains 15 red M&Ms, 10 blue M&Ms, and 5 brown M&Ms. Three M&Ms are drawn randomly from the urn. Find the probability that all three are the same color.

   Solution: There are 30 M&Ms in the urn altogether, so the number of possible outcomes of the experiment is $C(30, 3) = 4060$.

   The number of ways to draw three red M&Ms is $C(15, 3) = 455$; the number of ways to draw three blue M&Ms is $C(10, 3) = 120$; and the number of ways to draw three brown M&Ms is $C(5, 3) = 10$.

   There are $455 + 120 + 10 = 585$ ways to draw 3 M&Ms of the same color, so the probability of this event is $585/4060 \approx 14.4\%$.