Probability And Counting Funsheet

1. How many 4 letter "words" can be spelled from the letters ABCDEFG without repeating any letters?

2. How does your answer to question 1 change if repetition is allowed?

3. When tossing 4 coins, what is the probability of getting exactly 2 heads?

4. When tossing 4 coins, what is the probability of getting at least 2 heads?

5. When rolling two dice what is the chance of getting snake eyes (two 1's)?

6. When rolling two dice what is the chance of getting a 1 and a 2?

7. When rolling 4 dice what is the chance of getting 4 1's?

8. When rolling 4 dice what is the chance of getting 2 1's and 2 3's?

9. An urn contains 6 blue chips and 4 green chips. Choosing 2 chips at random from the urn (without replacement), what is the chance they are both green? Two different colors? If you picked 4 random chips, what is the likelihood you will get 3 blues and 1 green?

10. Ten people are randomly standing in line. What is the probability that the triplets Josie, Flosi, and Rosie are standing next to one another?

11. Suppose the 10 people were instead arranged around a table. How likely is it that the triplets are next to one another now?

12. Let's play some poker! For the following, assume you are randomly dealt a poker hand of 5 cards from a 52 card deck. Find the probability of having:

    i. Four of a Kind (four of one denominations and 1 other random card)
    ii. 3 of a kind (three of one denomination and two other random, un-paired cards)
    iii. Full House (three of one denomination and two of another)
    iv. Flush (all five cards are the same suit)
    v. Straight (5 cards in a row, like 3-4-5-6-7, any suit. No "going around the corner".

vi. Straight Flush (Just like v, but all the same suit)
vii. Two pair (and one other random card)

13. You are dealt 7 cards from a deck of 52 cards. The first two cards are an Ace and a King. What is the chance that you'll end up with exactly 3 Aces and 2 Kings (and two trash cards).

Section B: These next two problems require a basic knowledge of conditional probability. They should be completed *before the end of the unit*. Both are challenging and a tree diagram might be helpful.

1. There are 3 boxes in front of you each containing four coins. One box has all silver coins, one has all gold coins, and one has two of each. You choose a box and take a coin from it. Given that this coin is gold, what is the probability of you reaching into the same box and pulling out another gold coin?

2. Two cards are drawn at random from a reduced deck consisting of 4 Jacks and 4 Queens. What is the probability that the cards are…..

    a) Both jacks?
    b) Both jacks given that one is a jack?
    c) Both jacks given that one is a red jack?
    d) Both jacks given that one is the jack of hearts?