1) A hat contains 3 red slips of paper and 2 green slips of paper. One slip after another is drawn from the hat, without replacement. The colors of the drawn slips as well as the order in which they were drawn is recorded. The process is terminated whenever the same color is drawn twice in a row or there are no more slips left in the hat. What is the size of the corresponding sample space.? Hint: Draw a tree.

   Example: One outcome would be RGRGR (red, then green, then red, then green, then red), another is GG.

   a) 16 b) 8 c) 12

   d) 7 e) 9 f) none of the above

2) Adam, Barb, Candy, Doug, and Earl go to the movie theater and sit in a row with exactly 5 seats. How many different ways can they arrange themselves?

   a) 32 b) 25 c) 5

   d) C(5,5) e) 120 f) none of the above

3) You roll two fair dice and look at the result. What is the probability that you do not see a 1 or a 2 on either die?

   Example: Rolling a 4 on the first die and a 5 on second - neither die came up with a 1 or 2.

   a) 12/36 b) 20/36 c) 25/36

   d) 24/36 e) 16/36 f) none of the above

4) Find $n(A \cap B)$, given that A and B are subsets of U with $n(U) = 100$, $n(A') = 77$, $n(B) = 15$, and $n(A \cup B) = 31$.

   a) 69 b) 14 c) 8

   d) 23 e) 7 f) none of the above

5) You are casting a play. There is one female role to be cast: Old Mother Hubbard. And there are three male roles to be cast: the Butcher, the Baker, and the Candlestick Maker. 3 women and 4 men try out. How many ways can you cast the play?

   a) 35 b) 7 c) 72

   d) 27 e) 12 f) none of the above

6) Of a group of 100 people, 15 smoke, 42 drink coffee, and 3 smoke but don't drink coffee. How many drink coffee but don't smoke?

   a) 30 b) 27 c) 60

   d) 40 e) 42 f) none of the above

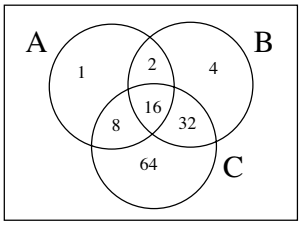
7) How many 5 digit numbers are there that consist of only 4's and 8's?

Examples: 44888, 44444, 84848, 84444.

a) 42 b) 32 c) 16

d) 48 e) 60 f) none of the above

8) Let A, B, C be subsets of a universal set U where $n(U) = 412$. Shown below is a Venn diagram for the sets A, B, C (which has been labelled with the number of elements in its various subsets). How many elements are in the set $(A' \cup B' \cup C')$?



a) 396 b) 412 c) 388

d) 285 e) 370 f) none of the above

9) Suppose Ω is a universal set with $n(\Omega) = 100$, and suppose A, B, and C are subsets of Ω with:

$n(A) = n(B) = n(C) = 50$

$n(A \cap B) = n(B \cap C) = n(A \cap C) = 30$

$n((A \cup B \cup C)') = 22$

What is $n(A \cap B \cap C)$?

a) 8 b) 22 c) 28

d) 18 e) 78 f) none of the above

10) A hat contains 5 red slips of paper and 7 green slips of paper. Two slips are drawn out of the hat, at random, one after the other, and without replacement. What is the probability that both slips are red?

a) 20/132 b) 10/66 c) 35/66

d) 35/132 e) 10/132 f) none of the above

11) How many 3 letter words can be formed using the letters AABBCCDDEEFF?

Example: Here are some 3 letter words that can be formed: ACA, FDC, EBC.

Hint: How many 3 letter words are possible using the letters AAABBBCCCDDDEEEFFF (i.e. there are no "restrictions")?

a) 58 b) 6 c) 130

d) 226 e) 210 f) none of the above

12) Ima Quack has 6 patients in the waiting room, 2 men and 4 women. One patient is selected at random to see Dr. Quack and then another (at random). What is the probability that Dr. Quack sees a male patient and then a female patient?

a) 9/15 b) 6/15 c) 4/15

d) 8/15 e) 3/15 f) none of the above

13) Five boys and two girls are seated in 7 seats numbered 1 through 7. In how many ways can this be done so that the 2 girls are seated in seats 1 and 2?

a) 132 b) 10 c) 480

d) 240 e) 126 f) none of the above

14) A six-sided die is weighted so that rolling a 1, 2, 3, and 4 are equally likely and rolling a 5 is 2 times as likely as rolling a 4 and rolling a 6 is 2 times as likely as rolling a 4. What is the probability of rolling a 2?

a) 1/6 b) 1/7 c) 1/4

d) 1/3 e) 1/8 f) none of the above

15) You own 3 cars. Each is to be painted either red, or yellow, or black, or white. In how many ways can this be done in such a way that exactly 2 or the cars are the same color?

Examples: One way is to paint car 1 black, car 2 white, car 3 black. Another way is to paint car 1 red, car 2 red, and car 3 black.

a) 30 b) 81 c) 64

d) 28 e) 36 f) none of the above