1. 1. ­1 =462
   2. ­ = 5775
2. 1. The reasoning is that there are 8 letters in the total set and you can choose 3 E for their placement first. Then you have a remaining of 5 letters from which N appears twice, so you choose the number of ways to select a set of k items from a set of n distinct items
   2. Similarly, we start off with 8 letter than since we have 3 E and we don’t care about order we divide by 3! And likewise with the 2 N.
   3. = 420
3. 1. ­36 C­­­4 ­= 58905

A1^A2^A3



A1^A3

A1^A2



A2^A3



* 1. P (Doesn’t like Football) = P(1 – A1) = 1 - .24 = .76
  2. P(Likes both football and basketball) = P ( A1  A­2 ) = P( A1 ) + P ( A2 ) -

P( A1 ∪ A2) = .24 + .18 - .3 = .12

* 1. P (Likes football and Basketball but not swimming) = P(A1∩ A2 ∩ A3c) =

.12 - .02 = .1

* 1. P ( likes at most two sports) = 1 - P ( A1 ∩  A2 ∩  A3­) = .98

1. 1. 1. P( A ^ B ^ C)
      2. P(A^ Bc ^ Cc)
      3. P(Ac ^ Bc ^ Cc)
      4. P(A v B v C)
      5. P(A^ Bc ^ Cc) v P(Ac ^ B^ Cc)v P(Ac ^ Bc ^ C)

* 1. P(A v B v C) is max if A B C are disjoint. In this case P (A v B v C) = P (A) + P (B) + P (C) = .75

P(A v B v C) is min if C is a subset of B which is a subset of A. So P (A v B v C) = .35

* 1. P ( A v B ) = P ( A ) + P (B) – P (A ^ B ) = .35 + .3 - .2 = .45
  2. P( A | B ) = P (A ^ B )/ P(B) = 2/3

1. 1. d(k, 1) = 1 for k > 0 because the only way to do this is to put k pumps in one tank. Likewise d(k, n) = 0 for 0 n > k because for n tanks there should be at least n pumps, so there isn’t a partition if n > k.
   2. For the first tank you have K pumps and then for the next u have k -1 and so on. Which is equal to K! options
   3. Since there is only one tank and more than one pump, then there are 2k  ways to decide whether or not to assign the k pump in the tank so 2k – 1guarantees that.
   4. Given j was set to the first tank, this leaves k - j to be assigned to n -1 tanks. J = 1,…, k- (n-1) so this is to make sure that there will be pumps left. If we give exactly j pumps to the first tank then there will be k choose j ( d ( k -j , n – 1), which after knowing j will give the equation provided.
   5. 3.31 x 1013
   6. 1 x 10 6 assignments/sec \* 3.15 x 107 sec/year = 3.15 x 10 13 assignments per year

how long in years would it take the computer to analyze all possible assignments?

3.15 x 10 13 / 3.31 x 1031 ways assignments per year = 1.2.

A screenshot of a cell phone

Description automatically generated

