

Stats 330 Assignment 2

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Problem 1

- (a) Ordered drawing without replacement. $P(7, 3) = \frac{7!}{4!} = 210$.
- (b) Ordered drawing with replacement. $7^3 = 343$.
- (c) Unordered (note the key word grouping) drawing without replacement.
 $\binom{7}{3} = \frac{7!}{4!3!} = 35$.
- (d)

Problem 2

From the 7 remaining digits, we have to pick a sequence of 4 distinct digits, which is a permutation. $P(7, 4) = \frac{7!}{3!} = 840$.

Problem 2

The formula for probability of equally likely, independent events is $\frac{|E|}{|\Omega|}$. We must find the size of both sets.

- Ω is the total number of possible license plates. For the letters, there are 26 possibilities each for 3 spots, and then 10 possibilities for 3 spots for the numbers. $|\Omega| = 26^3 * 10^3 = 1.7576 * 10^7$.
- E is similar to Ω , but with less possible letters and numbers. $|E| = (26 - 3)^3 * (10 - 2)^3 = 6229504$.

Using these numbers in the formula, we find that the probability is

$$\frac{|E|}{|\Omega|} = \frac{6229504}{1.7576 * 10^7} \approx 0.354$$