

COMPUTER SCIENCE 20, SPRING 2014
Module #24 (General Principles of Counting) - Checkin
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1. A license plate consists of either
 - 3 letters followed by 3 digits (standard plate)
 $(26^3)(10^3)$ - *Not considering uppercase and lowercase*
 - 5 letters (vanity plate)
 26^5
 - 2 characters - letters or numbers (big shot plate)
 $(10 + 26)^2$

Compute the number of different possible license plates.

2. How many of the billion numbers in the range from 1 to 10^9 (inclusive) contain the digit 1?
 $10^9 - (9^9 - 1)$
3. How many anagrams does the name “hardy” have? How about the names “littlewood” and “ramanujan?” The anagrams do not have to be dictionary words.
 $5! = 5 * 3 * 2 * 1$ - *hardy*

$$\frac{10}{2!2!2!} - \textit{littlewood}$$

$$\frac{9!}{2!3!} - \textit{ramanujan}$$

4. (a) A dodecahedron has 12 faces, each a regular pentagon. How many edges does it have?
 $12 * 5 = 60$ Since the edge of the dodecahedron is shared we have
 $12 * 5 = 60/2 = 30$
- (b) Three faces of the dodecahedron meet at each vertex. How many vertices does the dodecahedron have?
 $12 * 5/3 = 20$ We are dividing by 3 because the faces meet at each vertex and we only have 3 faces