

1. Standard Missouri car license plates have six characters, in order: letter, letter, number, letter, number, letter. For example, MK3 P2R. How many of these plates are possible?
2. How many ways can a student answer a multiple choice test with 10 questions, each with choices A, B, C, D? What if they can leave questions blank?
3. How many four letter words are there that contain at least one vowel?
4. Suppose you take a walk, and at each step move either North, South, East or West.
  - (a) How many 5 step walks are there?
  - (b) Suppose you never undo your last step (so don't follow N with S, etc.). How many 5 step walks are there?
  - (c) \* How many four step walks return to their starting point?
5. How many passwords are there:
  - (a) With 8 lowercase characters a-z?
  - (b) With 7 lowercase characters a-z and one number 0-9 at the end?
  - (c) With 7 lowercase characters a-z and one number somewhere?
  - (d) With 8 characters, any mix of a-z, A-Z and 0-9?

Assume there are about 2000 common English words.

- (e) With one common English word and a digit 0-9 at the end?
  - (f) With four common English words strung together, like 'correcthorsebatterystaple'?<sup>1</sup>
6. How many numbers between 1 and 700:
  - (a) Are divisible by 7?
  - (b) Are divisible by 5?
  - (c) Are divisible by 35?
  - (d) Are not divisible by either 7 or 5?

---

<sup>1</sup>Don't use this one as your password, it's very well known.