

1. How many 4 letter words of the 26 letter English alphabet are possible when:
 - a.) (Difficulty: 1) Repetition of letters is allowed?
 - b.) (Difficulty: 1) Repetition of letters is *not* allowed?
 - c.) (Difficulty: 1) Repetition of letters is allowed, but not consecutively?
2. Of your textbooks, you have 4 that are math, 3 physics, 3 English, and 2 history. You would like to order them on a shelf. How many ways can you order them if:
 - (a) (Difficulty: 1) the math books have to all come first, English second, physics third, and history fourth?
 - (b) (Difficulty: 2) you only need to keep all the books of the same subjects together?
3. Consider walks on the integers starting from 0 and going either +1 or -1 at each step.
 - (a) (Difficulty: 1) How many different walks of length 12 end at 2?
 - (b) (Difficulty: 3) How many different walks of length 12 go to 4 before ending at 2?
4. (Difficulty: 2) Consider walks on \mathbb{Z}^2 starting at the origin and shifting by one of the vectors $\{(-1, -1), (-1, 1), (1, -1), (1, 1)\}$.
How many different walks of length 20 are possible that end at the point (2,0)? By length of a walk, I mean the number of steps not the geometric length.