

1. A company generates identification codes for its employees by using two letters followed by a three-digit number. Leave answers as unsimplified products, unless exponents are possible.
  - (a) How many codes are possible if repeated letters and numbers are allowed?
  
  - (b) How many are possible if they are not?
  
  - (c) How many codes use the same letter twice? (Repeated numbers are allowed also.)
  
  - (d) How many codes use the same digit all three times? (Repeated letters are allowed.)
  
2.
  - (a) How many 5-letter “words” begin with a consonant followed by 2 vowels? Leave answer unsimplified.
  
  - (b) How many begin with a consonant and end with a vowel? Leave answer unsimplified.
  
  - (c) How many begin and end with the same letter? Leave answer unsimplified.
  
3.
  - (a) How many 7-letter “words” are possible with no restrictions? (unsimplified w/exponents)
  
  
  - (b) How many don't use any vowels? Leave answer unsimplified.

4. (a) The names of fraternities and sororities usually consist of 2 or 3 Greek letters. There are 24 letters in the Greek alphabet. How many fraternity/sorority names are possible? (Show work, but simplify your answer.)
- (b) How many names do NOT use the letters alpha, beta, or gamma at all? (Show work, but simplify your answer.)
- (c) How many names do NOT use at least one alpha, beta, or gamma? (Show work, but simplify your answer.)
5. A manufacturing code consists of one letter followed by either 3, 4 or 5 digits.
- (a) How many codes are possible if symbols can repeat? (Show work, but simplify.)
- (b) How many codes are possible if the last three symbols in such a code must match? (Show work, but simplify.)
- (c) How many codes do NOT use any digits higher than 6? (Show work, but simplify.)
- (d) How many use at least digit higher than 6? (Show work, but simplify.)