Product Rule for Counting - www.m4ths.com – Steve Blades

(1) On a menu there are 3 different starters, 8 mains and 4 desserts. John wants a starter, main and a dessert. How many possible combinations can he choose from if he wants one of each?

(2) Jat is selecting her GCSE options. She needs to pick ONE subject from Block A, ONE from Block B and ONE from Block C. There are 6 subjects in A, 5 in B and 9 in C. How many different combinations can she choose from?

(3) John is having some home renovations. He needs a plumber, an electrician and a carpenter. He has 6 of each tradesperson to choose from. How many different combinations of tradesperson can he choose?

(4) Janet has some cards with numbers on. The numbers are shown below:

6 8 3 2 4

(a) How many different 5-digit numbers can she make using the numbers only once?

(b) How many different 5-digit odd numbers can she make using the numbers only once?

(c) How many different 5-digit even numbers can she make using the numbers only once?

(5) John has some scrabble tiles. They have the following letters on them:

A B C E

(a) How many different ways can he arrange the 4 letters?

(b) How many different ways can he arrange the 4 letters if they have to end in a vowel?

(6) Using the numbers below, write down how many numbers you can make greater than 6000. You can only use each number once.

5 3 1 6

(7) (a) Janet has a padlock with 4 dials on all with the numbers 0-9 on them. How many different combinations has she got for her code for the padlock?

(8) John is designing a website. He has 8 backgrounds to choose from, 32 fonts to choose from and 4 headers to choose from. How many possible combinations can he have if he needs a background, a font and a header?

(9) Janet is asked to make up a 3 single digit pin number. Her first number must be a multiple of 2 and the last must be a prime number. How many possible options has she got? An example is 417

(10) John is asked to pick a password. The password must start with a letter followed by a 2 digit odd number. How many combinations can he choose from?

(11) A code is made from two letters followed by 3 single digits. An example is GH209. How many different codes can you make? The numbers and letters can be repeated.

(12) A code can be made from 3 DIFFERENT letters and 2 odd single digit numbers. An example is FRD59. The letters cannot be repeated, and the numbers can't be repeated. How many possible codes are there?

(13) There n items to be chosen from in a bag. Fred needs 3 of the items. Given that he cannot choose the same item more than once, show that $n^3 - 3n^2 + 2n$ is an expression for the number of different ways that he can chose 3 of the items from the bag.