CN4004 Maths for Computing Tutorial

Permutations and Combinations

1. In how many different ways can the letters x, y, z, w, v be arranged?

2. Find the value of: $\frac{8! \times 5!}{4! \times 3!}$

3. Find the value of: a) $P(10, 3)$ b) $C(9, 6)$.

4. A committee of 20 people has to elect a chair, a vice-chair, a secretary and a treasurer. How many different ways are there of choosing these posts?

5. The winner of a children's competition is allowed to draw three prizes from a bag of 10 unique items. The runner up is then allowed to draw two items.

   How many different sets of prizes can be chosen by:

   a) the winner;
   b) the runner-up?

6. A gift shop sells 10 different colours of wrapping paper. Customers can get a discount if they buy three rolls of paper. They can choose three of the same colour, or two of one colour and one of another colour, or 3 different colours.

   How many different combinations can a customer choose from?

7. Imagine an alien alphabet consisting of the following symbols:

   € % @ π * £

   How many different three letter "words" can be made from these symbols? (Symbols can be repeated).

8. How many 3-digit numbers can be made from the digits 1-6 if:

   a) you are allowed to repeat digits;
   b) you are not allowed to repeat digits;
   c) you are not allowed to repeat digits and the number must end in 3;
   d) you are not allowed to repeat digits and the number must end in 1 or 4?

9. Four friends go on a fairground ride. They must sit in a row. Tracey does not want to sit at the end of the row. In how many different ways can the four be arranged?

10. Use Pascal's triangle to find the value of $C(4, 2)$; verify your answer by using the correct formula.

11. Use the binomial theorem to expand the expression $(2x - y)^4$

12. Use the binomial theorem to find the 3rd term in the expansion of the expression $(x + 2y)^6$