Permutations Part 1

1. Find the number of pathways from A to C, but having to pass through B.

C

		B		

A
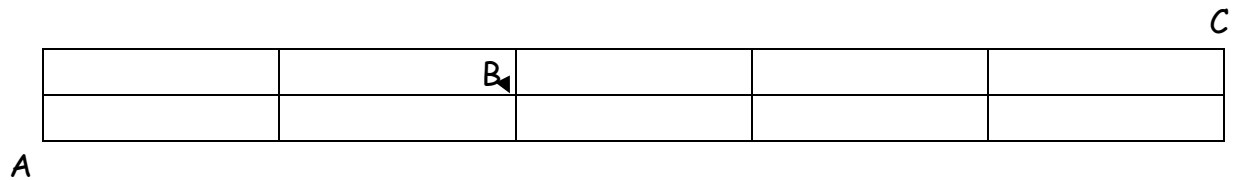
2. Refer to the pathway diagram above. The events, 'passing through B' and 'not passing through B', are complementary. This means that the pathways from A to C (always moving up or right) either go through B or they do not. There are no other options. The pathways that do not pass through B is equal to the total number of pathways from A to C subtract the number that pass through B. How many pathways do not pass through B?

3. There are 2 roads between cities A and B. There are 7 roads between cities B and C.

   a) How many ways can a person travel from A to C by way of B?

   b) How many ways can a person make a round trip from A to C and back to A by way of B, without using the same road twice?

4. Suppose a person has a choice of 6 different computers, 3 different monitors and 5 different printers. How many ways can he/she select a computer system?

5. Show a tree diagram to list all the possible outcomes for the gender of the children in a family that has 3 children.

6. Determine the total number of licence plates if each plate consists of 3 letters followed by 3 numbers.

7. Simplify each expression.

a) $\dfrac{n!}{n}$

b) $\dfrac{(2)(n!)}{(4)(n-1)(n-3)!}$

c) $\dfrac{(n-1)!(n+1)!}{(n!)^2}$

8. Solve for n, given $(2)(_7P_2) = {_nP_2} + 12$

9. Given $_nP_2 = 132$, the value of n must be a natural number. In the process of solving for n, what is the extraneous root?

10. A football team plays a 12 game schedule. How many ways can the schedule end with 7 wins, 3 losses and 2 ties?

11. How many different 10-letter 'words' be made using the letters from the word STATISTICS?

12. There are 12 available seats on an aircraft. If 7 customers are each booking 1 seat, how many different ways could they be assigned a seat?

13. A school has 10 doors. How many ways can you enter and leave the school if you cannot leave by the same door you entered?

14. The score at the end of the second period of a hockey game is 3-2 for the home team. How many different scores were possible at the end of the first period?