HAWKER COLLEGE
Engage | Inspire | Achieve

Learning Brief
SM1

1. Goals

By the end of this unit, students:

- understand the concepts and techniques in combinatorics, geometry and vectors

- apply reasoning skills and solve problems in combinatorics, geometry and vectors

- communicate their arguments and strategies when solving problems

- construct proofs in a variety of contexts including algebraic and geometric

- interpret mathematical information and ascertain the reasonableness of their solutions to problems.

This week's focus:
- Factorials and Permutations

2. Theoretical Components

STEP 1:

Readings:
Factorial notations:
- https://goo.gl/KzSb2d
- http://goo.gl/fyTFW5

Permutations:
- http://goo.gl/mttVve
- Focus on Permutations with/without repetition - https://goo.gl/6jAIZA
- More examples:

    https://bit.ly/40LBR31

Watch the following videos:
- https://goo.gl/IOXIHY
- https://goo.gl/rE6amy
- https://goo.gl/R2D0Ji

3. Practical Components

- Attempt all the questions in Counting.pdf

- Ex 10.1: question 3 onwards

4. Investigation

A: Assume that car number plates are sequenced as follows: DLV334 → DLV335 → ... DLV339 → DLV340 →... DLV999 → DLW000 and so on.
Using this sequence, how many number plates are there between DLV334 and DNU211 inclusive?
B: Show that $P(n+1, 3)=n^3-n$
C: How many paths are there from A to B if you are only allowed to move either down or to the right on the lines of the grid?
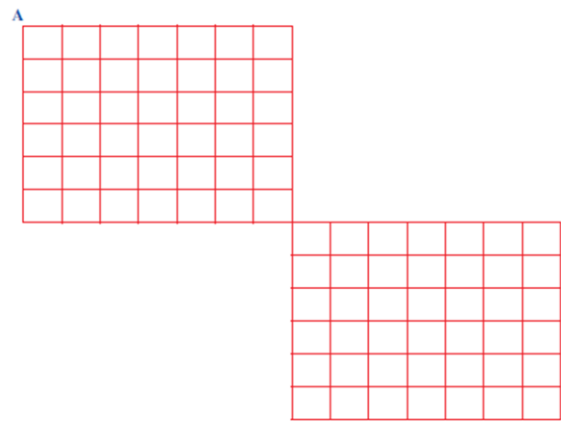
20 marks

5.QFO
Quiz/Forum/Other

Permutations and Combinations: http://goo.gl/5Bhn
Something to think about: A circular r-permutation of n people is a seating of r of these n people around a circular table, where seatings are considered to be the same if they can be obtained from each other by rotating the table. Find a formula using nPr to count circular r-permutation of n people.