

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:

- Binomial Expansion & Pigeonhole Principle
- Vectors – introduction.

2. Theoretical Components

STEP 1:

Readings:

Read examples: ABOUT/RESOURCES/ S1/WK12 (9.6).

Brief notes and examples:

Binomial Theorem: <https://bit.ly/2VQnT1d>
<https://bit.ly/2Yn27Ug>

Vectors: <http://goo.gl/dFhTAV>
<https://bit.ly/2VQ5Qs0>

Watch videos with examples:

Binomial Theorem:
Using $C(n,r)$: <https://goo.gl/llx4kL>
Using Pascal's: <https://goo.gl/gd00pm>

Vectors:
Intro: <https://goo.gl/ZrcGL7>
+/-: <https://goo.gl/PGOJMg>

3. Practical Components

STEP 2:

Ex 9.6: Questions 334-360

ABOUT/RESOURCES/S1/WK12 Binomial Theorem

Do ALL: <http://goo.gl/dFhTAV>

4. Investigation

A: Determine the value of $(3.14)^6$ using binomial expansion. Round off your final answer to 3 decimal places.

B. The first two terms in a binomial expansion are:
 $(a + b)^3 = 8 + 12e^x + \dots$

i) Find a and b .

ii) Hence determine the remaining two terms of the expansion.

C: Find the coefficient of x^{-1} in the expansion of $(1 + x)^n \left(1 + \frac{1}{x}\right)^n$, where n is a positive integer.

D: Find the coefficient of x^5 in the expansion of $(2x + 3)(x - 2)^6$

20 marks

5.QFO

Quiz/Forum/Other

Something to think about:

In a series of 5 games to be played between 2 equally matched teams, the first team to win 3 games becomes the champion. Team A has won the first game. Find the probability that team A will be the champion.