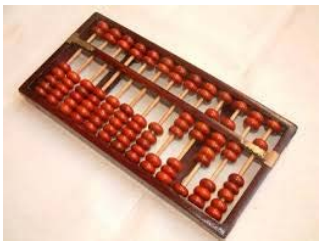
Week 12
Term 2
2018

Learning Brief

Specialist Mathematics (AC)
Unit 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 & Pigeon Hole Principle
- Vectors – introduction.

Theoretical Components

STEP 1:

Readings:

Read examples: ABOUT/RESOURCES/2017 S1/WK12 (10F).

Brief notes and examples:
Binomial Theorem: https://goo.gl/f2OaXd
Vectors: http://goo.gl/dFhTAv

Watch videos with examples:

Binomial Theorem:
https://goo.gl/llx4kL
Using C(n,r): https://goo.gl/eH0O0Z
Using Pascal's: https://goo.gl/gd00pm

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

Practical Components

STEP 2:
Attempt all the questions:
ABOUT/RESOURCES/2017 S1/WK12 Binomial Theorem
Do ALL: http://goo.gl/dFhTAv

Investigation

STEP 3:

A: Determine the value of $(2.01)^6$ using binomial expansion. Round off your final answer to 2 decimal places.

1 mark

B. The first two terms in a binomial expansions are:
$(a+b)^3 = 8 + 12e^x + \cdots$.
i) Find a and b.
ii) Hence determine the remaining two terms of the expansion.

2 marks

C: Use Binomial Theorem to expand $(x^2 - 3x + 1)^3$.

1 mark

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

1 mark

Q/F/O
(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.