Week 4/5
Term 1
2022

HAWKER COLLEGE
Engage | Inspire | Achieve

Learning Brief
SMM1

$$P(A/B) = \frac{P(A \cap B)}{P(B)}$$

$$P(B/A) = \frac{P(A \cap B)}{P(A)}$$

Goals

This fortnight we are going to:

- Determine the probability of simple and compound events
- Use tree diagrams, Venn diagrams and Karnaugh maps to determine the sample space and probability of compound event
- Use addition principle to compute probabilities of mutually exclusive (and non-mutually exclusive or inclusive) events
- Understand and use the definition of conditional probability
- Use the relative frequency approach to assigning probability to find the conditional probability of an event from a two-way table
- Use the multiplication rule to find the probability of the intersection of two events
- Use the multiplication rule to find the probability of the intersection of more than two events
- Determine if two events are independent

Theoretical Components

Make notes on the following chapters and websites:

Maths Quest 11 Mathematical Methods

- 11C Tree diagrams and lattice diagrams
- 11D The Addition Law of Probabilities
- 11E Karnaugh maps and probability tables
- 11F Conditional probability
- 11H Independent events
- 12H Applications to probability

Conditional Probability:

- https://www.bbc.co.uk/bitesize/guides/zsrq6yc/revision/8
- https://www.khanacademy.org/math/statistics-probability/probability-library/probability-sample-spaces/v/events-and-outcomes-3
- https://www.khanacademy.org/math/statistics-probability/counting-permutations-and-combinations/combinatorics-probability/v/probability-using-combinations

Set Notation handout (to be completed over the next three weeks)

Practical Components

Do the following questions:
Organise your solutions neatly in your exercise book.

Chapter 11 and 12 of Maths Quest 11 Mathematical Methods (pdf – Google Classroom)

- 11C: All even numbered questions
- 11D: All odd numbered questions
- 11E: 5, 8, 10, 12-16
- 11F: 1, 3, 9, 10-12, 14, 15, 17, 19, 21
- 11H: 1a, e, 2, 3, 5, 9, 16, 18
- 12H: All odd numbered questions

Set Notation booklet

Mathspace task

Investigation

See next page

In-Class - Week 5 Wednesday

Other

Complete Mathspace task.

In **Week 5** you are to sit an **In-Class Task** worth 15% on Wednesday. It is an "**open book**" task given under test conditions. You will be allowed to bring in your notes and worked exercises since Week 1 and, of course, your CAS calculator. Line 6 – You will need to meet in our classroom at 1:20 pm.

Week 4 and 5 Investigation

1. The purpose of this task is to find a rule for calculating $P(A \text{ and } B)$ for two events A and B. suppose a coin is tossed and a die is rolled at the same time. The results of the coin toss will be called outcome A, and the result of the die roll will be outcome B.
    a. Draw up a tree diagram to show all the outcomes.
    b. Copy and complete the table:

	$P(A \text{ and } B)$	$P(A)$	$P(B)$
$P(\text{a head and a } 4)$			
$P(\text{a head and an odd number})$			
$P(\text{a tail and a number larger than } 1)$			
$P(\text{a tail and a number less than } 1)$			

    c. What is the connection between $P(A \text{ and } B)$, $P(A)$ and $P(B)$?

2. In a class of 30 pupils, 12 got an A grade in Maths, 8 got an A grade in Physics and 8 got an A grade in Japanese. 3 got A grades in Maths and Physics. 3 got A grades in Maths and Japanese. 4 got A grades in Physics and Japanese. 2 students got A grades in all three of the above subjects.
    a. Draw a Venn diagram to represent the above data.
    b. One student is chosen at random. Find the probability that they have an A grade in:
        i. At least one of the three subjects
        ii. Only one of the three subjects
        iii. Japanese but not Physics