



## Goals

This fortnight:

- 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

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

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

## Theoretical Components

Read through the following chapters and make notes:

- 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

View the following websites and make notes:

Conditional Probability:

- <https://www.bbc.co.uk/bitesize/guides/zsrq6yc/revision/8>
- <https://www.khanacademy.org/math/precalculus/x9e81a4f98389efdf:prob-comb/x9e81a4f98389efdf:independent-events-precals/v/events-and-outcomes-3>
- <https://www.khanacademy.org/math/precalculus/x9e81a4f98389efdf:prob-comb/x9e81a4f98389efdf:independent-events-precals/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 before the In-Class test)

## Practical Components

**Do the following questions:**

Organise your solutions neatly in your exercise book.

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

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

Mathspace Task

## Investigation

See next page

**In-Class** on Friday Week 5

**QFO**

Quiz/Forum/Other

Complete the Mathspace task.

In **Week 5** you are to sit an **In-Class Task** worth 15% on Friday. 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.

## Week 4/5 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.

- Draw up a tree diagram to show all the outcomes.
- Copy and complete the table:

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

- 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.
- Draw a Venn diagram to represent the above data.
  - One student is chosen at random. Find the probability that they have an A grade in:
    - At least one of the three subjects
    - Only one of the three subjects
    - Japanese but not Physics