Week 3/4
Term 3
2023

HAWKER COLLEGE
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Learning Brief

SMM4

Goals

This fortnight we are going to:

- Understand probability distributions for discrete random variables
- Distinguish between discrete and continuous random variables
- Construct probability histograms
- Compute the central tendency and variability of discrete distributions (i.e. find the mean and variance of a discrete probability distribution)
- Compute the 95% confidence interval for a random variable, given the mean and the variance

Theoretical Components

Make notes on the following chapters:

Maths Quest 12 Mathematical Methods

- 10A - Probability revision
- 10B - Discrete random variables
- 10C - Measures of centre of discrete random distributions
- 10D - Measures of variability of discrete random distributions

Expected Values:

- https://www.youtube.com/watch?v=j__Kredt7vY&list=PL4C863861E3B2E380
- https://www.youtube.com/watch?v=OvTEhNL96v0

Probability Distribution:

- https://www.intmath.com/counting-probability/11-probability-distributions-concepts.php

Practical Components

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

Chapter 10 of Maths Quest 12 Mathematical Methods (pdf – Google Classroom)

- 10A: As many as you need
- 10B: 1, 3, 5, 7, 8, 11, 13, 17, 24
- 10C: 1, 3, 10, 12, 18
- 10D: 3, 5, 7, 14, 15, 20

Mathspace

Investigation

Assignment due in Week 4

Other

Fun fact: Infinite sets can be classed as either ‘countable’ or ‘uncountable’. A countably infinite set is one that can be thought of as being discrete, such as the set of natural numbers, while an uncountably infinite set is one that can be thought of as being continuous, such as the set of real numbers. Two infinite sets are defined as being the same size, or ‘cardinality’, if there exists a bijection between them. Cantor’s diagonalisation argument demonstrates that the cardinality of the set of natural numbers is strictly ‘smaller’ than the cardinality of the set of real numbers. It is unknown whether there exists an infinite set whose cardinality lies between that of the natural numbers and the real numbers; the continuum hypothesis states that no such set exists, but this is yet to be proved!