



Goals

This fortnight we are going to:

- Understand the concepts of relations and functions
- Understand the inter-connectivity of the written, graphical and algebraic forms of relation
- Develop mathematical models with various functions
- Use algebraic methods and graphing software to identify the key features of linear functions
- Functions and relations
- Odd and even functions
- Domain and range
- Further develop curve recognition, domain and range, using CAS to sketch functions

Theoretical Components

Make notes on the following chapters and websites:

Maths Quest 11 Mathematical Methods

- 1A Solving linear equations and inequations
- 1B Rearrangement and substitution
- 1C Gradient of a straight line
- 1D Sketching linear functions
- 1F Finding the equation of a straight line
- 1G Distance between two points and midpoint of a segment
- 1H Linear modelling
- 4C Domain and range
- 4D Types of relations (including functions)

Linear modelling:

- <http://zonalandeducation.com/mmts/functionInstitute/linearFunctions/linearFunctions.html>
- <https://www.mathsisfun.com/algebra/linear-equations.html>
- <https://www.mathsisfun.com/gradient.html>
- https://www.mathsisfun.com/data/straight_line_graph.html
- <https://www.mathsisfun.com/algebra/line-equation-point-slope.html>
- <https://www.mathsisfun.com/algebra/linear-equations.html>

Functions:

- <https://www.purplemath.com/modules/fcns.htm>
- <https://www.mathsisfun.com/sets/function.html>
- <https://www.mathsisfun.com/sets/domain-range-codomain.html>
- <https://www.mathsisfun.com/sets/functions-common.html>
- <https://www.mathsisfun.com/algebra/functions-odd-even.html>

Practical Components

Do the following questions:

Organise your solutions neatly in your exercise book.

Chapter 1 and 4 of Maths Quest 11 Mathematical Methods (pdf – Google Classroom)

- 1A: 3
- 1B: 3, 5
- 1C: 1a, 2c, 3e, 7, 8
- 1D: 8e, 9c, f, 14, 15
- 1F: 5a, b, 8, 10, 12-15
- 1G: 1, 5
- 1H: All even numbered questions
- 4C: 1b, g, 2d, h, 3c, 4, 7, 10
- 4D: 1a, d, g, j, 2a, d, g, j, 4

Two Mathspace task

Investigation

See next page

Other

Complete Mathspace tasks.

Fun fact: How do computers render smooth curves for graphics design and animation? One technique is that of Bézier curves, which is essentially the result of linear interpolation. Its inventor, Pierre Bézier, originally invented this method to help design Renault cars in the 1960s.

Week 6 and 7 Investigation

This year Ann's age is the sum of the digits of her maths teacher's age.
In five years, Ann's age will be the product of the digits of her maths teacher's age at that time.

What is the age difference between Ann and her teacher?

Develop an algebraic model(s) to solve this situation.