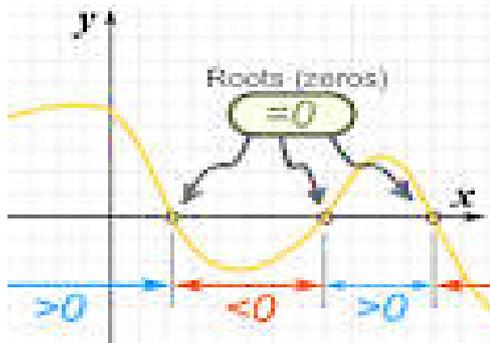


Goals



This fortnight we are going to:

- Familiarise yourself with the features of functions: linear, quadratic, square root, cubic, hyperbola (reciprocal function), semi-circle, exponential, absolute
- Be aware of other functions such as logarithmic, circular functions (the trigonometric functions - sine, cosine and tangent)
- Use algebraic methods and graphing software to identify the key features of polynomial functions
- Develop mathematical models using the above functions
- Graph higher powers from factorised form, types of roots, shapes of functions, intercepts, odd and even powered functions
- Polynomial algebra (+, -, x, divide, evaluate), polynomial long division

Theoretical Components

Make notes on the following chapters and websites:

Maths Quest 11 Mathematical Methods

- 3B Long division of polynomials
- 3D The remainder and factor theorems
- 3E Factorising polynomials
- 3G Solving polynomial equations
- 3H Cubic graphs - intercept method
- 3I Quartic graphs - intercept method
- 3K Domain, range, maximums and minimums

Knowledge checklist:

- Polynomials – what are they?
- Extrema Values – know how to identify extrema behaviour by looking at the polynomial functions
- Algebraic skills of factorising, to get polynomials into fully factorised forms so you can solve and identify roots
- Polynomial long division is an essential algebraic skill
- Once you have found the roots, be able to identify their behaviour
- From fully factorised form be able to sketch polynomials of degree 3 and higher

Practical Components

Do the following questions:

Organise your solutions neatly in your exercise book.

Chapter 3 of Maths Quest 11 Mathematical Methods (pdf – Google Classroom)

- 3B: 1a, c, k, 5a, c
- 3D: 2a, b, 5, 6a, e
- 3E: 2a, d, g, j
- 3G: 1-5 (three from each)
- 3H: 1-4 (three from each), 5, 7
- 3I: 1, 2, 8
- 3K: 1, 5

Mathspace task

Investigation

None for this fortnight – Work on the assignment, due Week 13 (Thursday 12/05/22 4pm)

Other

Work on assignment

Fun fact: The quadratic formula can be used to completely solve a quadratic equation. Similarly, there exists cubic and quartic formulas to solve degree three and four polynomials. But does there exist a quintic formula to solve degree five polynomials? The answer is no, and not because we haven't found one yet. The French mathematician Évariste Galois proved that such a formula is impossible. This work gave rise to a field of mathematics called Galois theory, which plays an important role in modern abstract algebra.