**Bishop Heber High School**

| Subject | Year | Term |
|---|---|---|
| **Further Maths** | **13** | **1** |

## Topic

**Complex Numbers, Polar Co-ordinates, Algorithms on Graphs, Series, Hyperbolic Functions, Linear Programming, Critical Path Analysis**

## Content (Intent)

**Prior Learning (Topic)** Recurrence Relations, Exam Preparation, Calculus, Series, Algorithms & Graph Theory

- Different ways to write, manipulate & use complex numbers.
- Polar graphs & applications
- Formulating and solving network problems
- Maclaurin Series
- Definitions of Hyperbolic Functions
- Calculus involving Hyperbolic Functions

**Future Learning (Topic)** Further Calculus, Transportation & Allocation Problems, Flows in Networks, Dynamic Programming, Decision Analysis

| What Knowledge and Skills will be taught (Implementation) | How will your understanding be assessed & recorded (Impact) |
|---|---|
| • Convert between polar and Cartesian coordinates, plot graphs, calculate finite areas, find tangents & normal to polar curves.<br>• Use Floyds Algorithm to find shortest paths between all the pairs of vertices<br>• Use The Travelling Salesman Algorithm to find shortest routes, and interpret the solution in the context of the problem. | Formal Homework (Pure Maths & Decision Maths)<br><br>Ongoing self-assessment<br><br>**Pre-Mock exams** (Pure Maths & Decision Maths) |
| • Express certain functions as an infinite series using Maclaurin's expansion.<br>• Use the method of differences to sum simple finite series<br>• Know the definitions of Hyperbolic Functions, their inverses, and uses in calculus.<br>• Solve problems with a maximum of 4 variables using The Simplex Algorithm & The Big M Method<br>• Draw & interpret resource histograms & scheduling diagrams. | Formal Homework (Pure Maths & Decision Maths)<br><br>Ongoing self-assessment |

## How can parents help at home?

Check assessment results and work completed in formal homework books.
Encourage use of MyMaths (www.mymaths.co.uk) and MathsGenie (www.mathsgenie.co.uk)
Regularly review previously taught topics

## Helpful further reading/discussion (including Reading and Vocabulary Lists)

**Textbooks (ISBN):**
Core Pure Mathematics Book 2: 9781292183343
Decision Mathematics 1: 9781292183299
Decision Mathematics 2: 9781292183305
Website: https://qualifications.pearson.com

**Vocabulary Lists**

Surplus
Slack
Unity
Constraints
Composite
Tableau
Optimality