Mathematics SL

June Exam

Grade 11 Syllabus Coverage:

IB Syllabus Outline

Topic 1- Algebra

Topic 2- Functions and Equations

Topic 3- Circular Functions and trigonometry

Topic 4- Matrices

Topic 5 – Vectors

Topic 6- Statistics and probability (Topic 6 and 7 are covered in grade 12)

Topic 7- Calculus

Semester 1 coverage by chapter and Unit

**Unit 1:**

Chapter 1: Functions (IB TOPIC 2)

1. Relations and Functions
2. Function Notation
3. Domain and Range
4. Composite functions
5. Sign Diagrams (you should be able to generate these without a calculator)
6. The reciprocal function
7. Asymptotes of other rational functions
8. Inverse functions

Chapter 2: Sequences and Series (IB TOPIC 1)

1. Number patters
2. Sequences of numbers
3. Arithmetic sequences (linked to linear functions and constant growth)
4. Geometric sequences (linked to exponential functions and exponential growth (i.e. compound growth in finance or population growth)
5. Series (the sum of a sequence)

**Unit 2:**

Chapter 3: Exponentials (IB TOPIC 1 and 2)

1. Index notation
2. Evaluating powers
3. Index laws (know these by heart!)
4. Rational indices
5. Algebraic expansion and factorization
6. Exponential equations
7. Graphs of exponential equations
8. Growth and decay
9. The natural exponential (One Eyed Lennys special number *e*!)

Chapter 4: Logarithms (the inverse for exponentials) (IB TOPIC 1 and 2)

1. Logarithms
2. Logs in Base 10
3. Laws of logs (also know these bar heart!)
4. Natural logs
5. Exponential equations using logarithms
6. The change of base rule (this is a useful rule but remember the new operating system on the TI 84 can handle different bases as well)
7. Graphs of logarithmic equations
8. More growth and decay problems (this time using logs to solve!)

**Unit 3:**

Chapter 5: Graphing and transforming functions (IB TOPIC 2)

1. Families of functions
2. Transformations of graphs (know the six transformations by heart! i.e. –f(x) vs f(-x)

Chapter 6: Quadratic equations and functions (IB TOPIC 2)

1. Quadratic equations
2. The discriminant of a quadratic
3. Graphing quadratic functions
4. Finding a quadratic from its graph
5. Where functions meet
6. Problem solving with quadratics
7. Quadratic optimization problems (finding maximum and minimum for real life applications)

Ch. 7 The Binomial Expansion (IB TOPIC 1)

1. Binomial expansion (using pascal’s triangle)
2. Binomial theorem (using the formula and nCr)

**Semester 2:**

**Unit 4**

Ch. 8 The Unit circle and radian measure (IB TOPIC 3)

1. Radian measure
2. Arc length and sector area
3. The unit circle and the basic trigonometric ratios
4. The equation of a straight line (y = mx + b or y = (tanø)x + b to represent slope)

Ch. 9 Non-right angles triangle trigonometry (IB TOPIC 3)

1. Areas of triangles
2. The cosine rule
3. The sine rule
4. Using the sine and cosine rules (problem solving)

Ch. 10 Advance trigonometry (IB TOPIC 3)

1. Observing periodic behavior
2. The sine function
3. Modeling using sine functions
4. The cosine function
5. The tangent function
6. General trigonometric functions
7. Trigonometric equation
8. Using trigonometric equations
9. Using trigonometric models
10. Trigonometric relationships
11. Double angle formulae
12. Trigonometric equations in quadratic form.

**Unit 5**

ch. 11 Matrices (IB TOPIC 4)

1. Matrix structure
2. Matrix operations and definitions
3. The inverse of a 2 x 2 matrix
4. 3 x 3 matrices
5. Solving systems of linear equations

**Unit 6**

Ch. 12 Vectors in 2 and 3 dimensions (IB TOPIC 5)

1. Introduction
2. Geometric operations with vectors (adding and subtracting graphically)
3. 2-D vectors in component form
4. 3-D vectors in component form
5. 3-D vectors in component form
6. Algebraic operations with vectors
7. Parallelism
8. Unit vectors
9. The scalar product of two vectors

ch. 13 Lines and planes in space (IB TOPIC 5)

1. Lines in 2-D and 3-D
2. Applications of a line in a plane
3. Relationships between lines

Please note this is a VERY ruff outline of the topics we have covered this semester. Use this outline in conjunction with your notes, HW, quizzes and tests, as you revise.

I suggest going through this document and writing a summary of the most important equations and points from each chapter.

The exam will be split into CALCULATOR and NON-CALCULATOR sections.

**Non- Calculator 1 hour**

**Calculator 1 hour**