Course Title: IB Mathematical Studies Standard Level

A Level equivalency: AS Level

How will this course be assessed? You will be internally and informally assessed termly by the mathematics department in order to ensure this course is correct for you. At the end of the Year 1 (June 2019) you will complete your Internal Assessment running a mathematical investigation of your choice, this is worth 20% of your final grade. At the end of the second year (May 2020) you will sit 2 calculator exam papers, Paper 1, which consists of 15 short response questions (worth 40%) and Paper 2, which consists of 5 extended response questions (worth 40%)

Topics to be covered:

- **Introduction to the graphic display calculator**
- **Number and algebra**
- **Sets, logic and probability**
- **Functions**
- **Geometry and trigonometry**
- **Statistics**
- **Introductory differential calculus**
- **Financial mathematics**

Course outline:

During year 12, you will start to work towards the basic skills required for the exams and coursework. You will be focusing on a lot of number, algebra, sets logic and functions. You will then spend a short time preparing for your Internal Assessment.

During year 13, you will continue to work towards the other units within your exams.

Throughout the 2 year course there will be termly assessments to ensure you are keeping on track with your studies and we can set any intervention required.

One final thing to note is that you will all be expected to own a graphical display calculator, these calculators are extremely helpful in your studies, the model we recommend is "Casio Graphics Calculator FX-9750GII".

Task:

This assessment tests basic maths skills that are **essential** prerequisites for the study of IB maths.

Check your work carefully.

Year 12 Entry Assessment task   Name:

Question	Workings (where necessary) and answer	Marks
Section 1: Simplifying		
1. Simplify $$x^2 - 4x + x + 4$$		1
2. Simplify $$7x + 5y - (4x - 2y)$$		1
3. Simplify $$5x^4y \times (2x^2y)^3$$		1
Section 2: Expanding		
4. Expand $$5x(9y - 12x)$$		1
5. Expand $$(x - 8)(x - 1)$$		1
6. Expand $$(3x + 4)(2x - 7)$$		1
Section 3: Factorising		
7. Factorise $$12x^2 - 8x^3$$		1
8. Factorise $$x^2 - 11x + 18$$		1
9. Factorise $$x^2 - 64$$		1
Section 4: Solving		
10. Solve $$x - 30 = 11x - 10$$		1
11. Solve $$14x - 3 = 3x - 5(x - 1)$$		1
12. Solve $$\frac{7x - 1}{3} = 3x - 5$$		1
Section 5: Number		
13. Evaluate $$\sqrt[3]{125} + 2^4$$		1
14. Evaluate when $x = 3$ $$x^3 - 2x^2$$		1

15. Evaluate when $x = -2$ $2x^3 + 3x^2 - 5x$		1

Task 2: Number Properties:

1) Research what is meant in mathematics by the following words
   a. Sum
   b. Difference
   c. Product
   d. Quotient
   e. Prime Number
   f. Composite number
2) Express 252 as the product of its prime factors
3) List all the prime numbers less than 60
4) How many prime numbers are even? List them
5) Find the highest common factor of 18 and 24
6) Find the lowest common multiple of 9 and 12
7) Evaluate 2 x (3 x 6 – 4) +7

Task 3: Laws of Algebra:

1) Write out the first 10 powers of 5
2) Simplify $7^4 \times 7^{-2}$
3) Express 27 in the simplest form with a prime number base
4) Expand and simplify $7x(x - 7)$
5) Expand and simplify $(2x - 5)(x + 6)$
6) Expand and simplify $(x + 4)(x + 9) + (x + 6)(x - 6)$
7) Expand and simplify $(x + 7)(x - 2)(2x + 3)$

Task 4: Equations and Formulae:

1) Solve for x: $2(x - 3) + 5(1 - x) = 2$
2) If r=2 and s=-5 find the value of: $(rs)^2$
3) When a certain number is trebled then decreased by 1, the result is twice as much as 5 more than the number. What is the number?
4) A post office has two lengths of mailing tube, 45cm and 75cm. They have 15 more short tubes than long tubes, and if the tubes were laid end to end they would cover 1995cm. How many 75 cm tubes does the post office have?
5) A coconut shy at the village fair offers three throws for £1, or seven throws for £2. In one hour, 187 throws are made, and the attendant takes £57. How many people bought three throws?
6) Solve using the method of elimination:
$$-2x + 5y = -3$$
$$3x + 4y = 16$$