

**IB Mathematics  
Standard Level  
2018-2019  
Mrs. Allshouse**

Welcome to our math class. Let's work together to make this a successful year for all of us!

**COURSE DESCRIPTION:**

This is a yearlong IB Standard Level math course. We will follow the curriculum set forth by the IBO. Students are placed in this course having successfully completed Algebra I Pre-IB, Geometry Pre-IB, and Algebra II/Trig IB as well as a teacher recommendation.

**TEXT:** *Standard Level Mathematics*; Pearson Education Limited; 2012

**Course of study:** The following is a brief list of the topics we will be mastering this year. The detailed syllabus is on my website under Course Guide.

**Probability and Statistics**

- Definition and laws of probability
- Problem solving strategies in Probability: Venn, lattice, and tree diagrams
- Conditional probabilities both formal and informal definitions
- Independence
- Statistical graphs and tables: frequency diagrams, histograms, ogives, and box-whisker plots
- Central measures of tendency
- Measures of dispersion
- Discrete Random variables: mean and variance
  - Binomial distributions
- Continuous Random variables: standardization of normal variables
  - Normal distributions

**Calculus - Differential and Integral**

- Limits and their properties
- Development of the derivative
- Differentiation
  - Basic rules of differentiation of algebraic functions and transcendental functions such as trigonometric, exponential, and logarithmic functions
  - Product rule, quotient rule, and chain rule
- Applications of differentiation: equations of tangents and normals, curve sketching, optimization problems, rates of change problems, related rates problems, and kinematics problems
- Development of the indefinite and definite integral
- Integration
  - Basic rules of integration of algebraic functions and transcendental functions such as trigonometric, exponential, and logarithmic functions
  - Applications of integration such as area between two curves, volumes of solids of revolution (disc and wash method), general and particular solutions to differential equations

## Vector Analysis

- Representing vectors: direction, magnitude, equal vectors, negative vectors and zero vector
- Algebra and Geometry of vectors: addition, subtraction, multiplication by scalars, angle between two vectors, and unit vectors
- Cartesian representation of vectors in 2-D and 3-D including base vector notation
- Scalar product of two vectors: definition, properties, and special cases
- Vector equation of a line in 2-D and 3-D

**FOR THE NON-SENIORS IN THIS CLASS:** After the IB exam has been taken we will work on 2 more additional topics. These will help prepare you for the higher level exam in your senior year.

## Mathematical Induction

- The principles of mathematical induction and proofs

## Complex Numbers

- Algebra and notations
- Geometrical representation: Argand diagram and properties
- Polar form
- DeMoivre's Theorem

## Items needed daily

- A three-ring binder
- Loose leaf paper – I will not accept any paper with frayed edges.
- Graph paper
- Straight-edge
- Graphic calculator

## To be successful in this class:

1. Come to class prepared.
2. Always pay attention in class and take good notes.
3. Do homework assignments to reinforce material and to prepare you for tests.
4. Study for tests by reviewing notes, assignments, and the text.
5. Observe the MPS Academic Honesty Policy and follow the student expectations outlined in your handbook.

## GRADING

Letter grades and percentage grades will follow the grading rules set forth in the Mercyhurst Prep handbook. Students will receive three term grades and one final assessment grade. Term grades will consist of total points converted into a percentage and letter grade at the end of each trimester. A comprehensive final assessment will be given at the end of the school year to anyone not sitting for the SL Mathematics IB exam given in May. This exam will be the 2019 SL IB exam and is worth  $\frac{1}{7}$  of the final grade.

## Homework

Homework will be assigned daily. Collected homework is due at the start of class. If homework is handed in any time after the start of class it will be considered late and points will be deducted. No credit will be given once the assignment is returned to the class. If you are absent the day homework is due, you must hand it in the day you return (even if this is not a class day). Homework will be posted on the MPS website. I cannot stress enough the importance of practice in a math class. The assignments are carefully selected to ensure enough practice to gain a solid understanding of the concepts we are working on.

## In-Class Assignments

In-class assignments are given to allow students to use their notes to complete problems pertaining to the topics we are currently working on. This set of problems will help us to gain a better understanding of where you are in mastering the unit concepts. They are handed in at the end of class.

## Tests

Tests are usually announced two classes ahead of the test date. An outline with review problems will be handed out the class period before the exam.

## Sample IB Questions

Sample IB questions will be handed out periodically. This set of problems will give you an opportunity to work on rigorous problems pertaining to the concepts covered in the course guide in a cumulative format.

## Mathematical Exploration

Math exploration is a written exploration paper that you are required to write for the internal assessment portion of the IB curriculum. In this paper you will *explore* a topic of mathematics in which you are genuinely interested. This will be due at the end of January. We will discuss this paper in detail in class.

**\*Students should keep a hard copy of all work/tests/assignments until the final grade is posted. In the event of a discrepancy or a missing or lost assignment, the burden of proof rests with the student.\***

## ATTENDANCE

If you are absent from a class, you are responsible to do the following:

- 1) Obtain missed notes from a classmate before the next class.
- 2) Check the website for a summary of what was done in class and the homework assigned.
- 3) If necessary, get any documents that were handed out in class.

If you are absent on a test day, you are responsible to do the following:

- 1) Have a parent or guardian notify me via e-mail stating that they are aware that you are missing an exam.
- 2) You must email me to tell me the day you will be returning to school so that we can arrange a make-up exam. Please be prepared to make up the test during your class time as soon as possible (within a day or two).

## Behavior

It is important to create a positive learning environment in every class. This is very easy to achieve. We must always respect one another, be compassionate towards one another and empower one another by believing in our own potential and the potential of everyone in the class. The vision statement, the mission statement, and the Academic Honesty Policy, which exemplify the charism of a Mercy education, are all an integral part of this classroom.

**Extra Help**

Please utilize our class time together as much as possible. Even the brightest of students have difficulty understanding concepts in mathematics. Please do not hesitate to see me if you are having trouble, and try not to get behind.

*It is easier to keep up than catch up.*

If you have any questions or concerns and would like to meet with me outside of class, please send me an e-mail or speak with me after class and we will set up a time to meet. My email is [pallshouse@mpslakers.com](mailto:pallshouse@mpslakers.com).

*Good luck & have a fantastic year!*