

Welcome to IB Mathematics: Applications and Interpretations SL! This course has an emphasis on the meaning of mathematics in context by focusing on topics that are often found in applications and/or modeling. This course also makes extensive use of technology to allow students to explore and construct mathematical models.

It is my advice that all students have their own graphing calculator. The best calculator for this course is the Ti-84 Plus CE. This calculator has all the tools and applications that we will use for this course. If you already own a different graphing calculator, you may continue to use it. However, instruction in class will be done using the Ti-84 Plus CE, so you may be able to borrow one from the class set for in class use, but these may not be taken home. We will spend time in class becoming familiar with the use of these calculators as they are allowed on all parts of the IB Exam that is taken in the spring semester.

The attached packet is designed to help you to review concepts that you should already be familiar with. The material in the packet has already been taught in previous courses, so it is assumed that you have learned the content, but this is a good refresher of the content to ensure that you are ready for the course at the beginning of the fall semester.

When completing math assignments, please follow the following guidelines.

- Use notebook paper.
- All working should be shown, neatly presented, and legible.
- Use pencils to complete work, as mistakes are inevitable and can be erased.
- Work the problems in order, and clearly indicate which problem you are working on.

The summer assignment will consist of two parts.

**Part 1:** A quick review of prior knowledge. A link to a brief video will be provided for you to watch should you need a quick refresher. Simply type the link into your browser and it will bring up the video.

**Part 2:** A brief exploration that you will complete. During the course, you will complete an exploration of your own, so this will help you to get an idea of an exploration that you will complete.

This assignment will be due during the first week of the semester. I recommend working on it over the summer to make sure that you are ready for class. If you have any questions while working on this assignment, you are always welcome to reach out to me via email. Please note that response times may vary over the summer, but I will do my best to respond to emails when I am able. [ayerdij@fultonschools.org](mailto:ayerdij@fultonschools.org)

**Part 1:**

1) Write a verbal description of each interval.

- |              |                   |                        |
|--------------|-------------------|------------------------|
| a) $(2, 4)$  | b) $[9, 10)$      | c) $(-\infty, -5)$     |
| d) $[-2, 1]$ | e) $(-9, \infty)$ | f) $(-\infty, \infty)$ |

2) Write the following inequalities as an interval.

- |                       |                |
|-----------------------|----------------|
| a) $-5 < x \leq 9$    | b) $0 < x < 4$ |
| c) $-6 \leq x \leq 1$ | d) $x \geq 3$  |

3) Multiply the binomials.

- |                       |                       |                 |
|-----------------------|-----------------------|-----------------|
| a) $(3x - 5)(2x - 4)$ | b) $(6x + 2)(6x - 2)$ | c) $(4x - 1)^3$ |
|-----------------------|-----------------------|-----------------|

4) Factoring

- |                     |                        |                     |
|---------------------|------------------------|---------------------|
| a) $5x^3 - 30x^9$   | b) $12x^3y^2 - 30x^5y$ | c) $x^2 + 12x + 20$ |
| d) $4x^2 - 12x + 9$ | e) $25x^2 + 60x + 36$  | f) $49x^2 - 64y^2$  |

5) Solve each system of equations by hand.

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|---|--|
| a) $\begin{cases} x + y = 10 \\ x - y = 2 \end{cases}$    | b) $\begin{cases} 2x + y = 7 \\ x = 2 + y \end{cases}$   |
| c) $\begin{cases} 2x + 5y = 8 \\ 3x + 2y = 1 \end{cases}$ | d) $\begin{cases} y = 3x + 10 \\ y = 3x - 9 \end{cases}$ |

Video Link for Example Problems: <https://www.youtube.com/watch?v=vU9ISELNU5w>

**Part 2:**

In this course, you will be completing an exploration that you design and investigate. We will work together on this and spend a lot of time on this. To give you an idea of what will be entailed, you will be tasked with answering the following question posed below. Make sure to document what you did to solve the problem and your thought process.

- 1) Mr. Ayerdi wants to run a marathon, which is 26.2 miles. To train for the marathon, he designs a training regime. He starts on the first week of training by running 1 mile, three times a week, and increases his distance by 1.2 miles each week. Create a model for the scenario and identify how many weeks it will take to reach the distance of 26.2 miles. Then, figure out how many total miles Mr. Ayerdi will have run while preparing for the marathon.
- 2) After you solve the problem above, make sure to reflect on your work with these questions.
  - a) What were your initial thoughts about this problem?
  - b) What approach did you use? Was it effective? Did you use multiple approaches?