

Dear Applications Students,

Please find your summer assignment below. You will be expected to complete all assignments below by Day 1 of class which is on August 15, 2022. Should you run into any issues or have questions, please reach out to Mr. Clemons for assistance (even if he is not your teacher).

### Assignment 1: Curriculum Continuance

You should complete **five strength tests per topic** below. In total, this is 15 strength tests. Each strength test has 5 problems, for a total of 75 questions for the entire summer. HL students must choose at least 2 of their chosen 5 from the “HL only” section. Try to spread the strength tests out to complete 2-3 strength tests a week. This will help you significantly in keeping the topics fresh and reducing the amount of review time when you return to school next year. Your strength test completion automatically saves for the teacher to see, so no need to turn in a physical document in August for Assignment 1.

Topic 1: Numbers and Algebra	Topic 2: Functions	Topic 3: Geo and Trigonometry
<u><b>SL and HL</b></u> 1.1 Scientific notation 1.2 Arithmetic seq and series 1.3 Geometric seq and series 1.4 Financial applications 1.5 Exponents and logarithms 1.6 Approximation 1.7 Amortization and annuity 1.8 Equations and systems  <u><b>HL ONLY</b></u> 1.9 Laws of logarithms 1.10 Rational exponents 1.11 Sum of infinite geo sequences 1.12 Intro to complex numbers 1.13 Further complex numbers 1.14 Matrices 1.15 Eigenvalues and eigenvectors	<u><b>SL and HL</b></u> 2.1 Straight lines 2.2 Functions 2.3 Graphs of functions 2.4 Key features of graphs 2.5 Introduction to modelling 2.6 Modelling skills  <u><b>HL ONLY</b></u> 2.7 Composite functions and inverse functions 2.8 Transformation of graphs 2.9 Further modelling 2.10 Scaling using logarithms and linearising data	<u><b>SL and HL</b></u> 3.1 Three-dimensional space 3.2 Triangle trigonometry 3.3 Applications of trigonometry 3.4 The circle 3.5 Perpendicular bisectors 3.6 Voronoi diagrams  <u><b>HL ONLY</b></u> 3.7 The circle revisited 3.8 Trigonometric ratios beyond acute angles 3.9 Planar (Affine) transformations 3.10 Vectors 3.11 Vector equation of a line 3.12 Vector kinematics 3.13 Products of vectors 3.14 Introduction to graph theory 3.15 Further matrices 3.16 Graph algorithms

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## Assignment 2: Internal Assessment Outline

On the first day of senior year it will be expected that you arrive with a detailed outline of what you plan to write your IA about. This should include resources and scholarly sources that you will be using. Just remember that I'm not allowed to give you detailed feedback, so small check-ins are a good way to make sure you're on the right track. As a reminder, you have not covered the majority of Topic 4 or Topic 5. Many of you will choose statistics-based IAs so it is okay if you haven't learned the math that you will use to investigate your topic. The final IA is not due until February so we have plenty of time to review the math before you apply it in your IA; this assignment is more focused on having a strong plan to start the year.

1. [Watch this video first.](#)
2. [Watch this video second.](#)
3. [Watch this video third.](#)

All questions below should be answered in a GoogleDoc by August 15, 2022:

### 1. Question/Topic you want to explore

- a. What is your general topic choice?
- b. Rationale (Why did you choose this topic? Why is this topic important to you?)
- c. How does it connect to your daily life or outside world?

### 2. Aims:

- a. What is the purpose of this paper?
- b. What will you be analyzing?
- c. How will you be analyzing it?
- d. Are you collecting your own data? If so, how will you go about this ?
- e. What are some extensions you might have after you're done
- f. What are other areas of math, science, etc that this can connect to?

### 3. Sources:

- a. Will you be using technology to help you assess your data?
- b. What can you compute by hand?
- c. At least **three** scholarly sources that will help you with your research (use same databases that you used for your research for your EE)

### 4. Share GoogleDoc with Mr. Clemons with all of the above by Day 1 of classes (8/15/22).

- a. We will be keeping all information in one Google Folder to track progress. You may end up switching your topic, but it's imperative that you start the process now.