Gymea Technology
High School
INSPIRE. LEARN. SUCCEED.

Year 12 Mathematics Extension 2

Assessment Task 1 – In Class Test

Due Date: Thursday 12th December Period 0, Week 9 Term 4

Date Distributed: Tuesday 26th November   **Task Weighting: 20%**

Outcomes

MEX12-1 *understands and uses different representations of numbers and functions to model, prove results and find solutions to problems in a variety of contexts*
MEX12-2 *chooses appropriate strategies to construct arguments and proofs in both practical and abstract settings*
MEX12-4 *uses the relationship between algebraic and geometric representations of complex numbers and complex number techniques to prove results, model and solve problems*

ASSESSMENT OUTLINE

1. WHAT AREAS OF LEARNING DOES THIS ASSESSMENT ADDRESS?

You will need to develop solutions and provide reasoning to a wide variety of problems and demonstrating your understanding of the following concepts:

Introduction to Complex Numbers	
• Define i as the solution to $x^2 = -1$ • Define a complex number $z = a + ib$ where $Re(z) = a$ and $Im(z) = b$ • Define the complex conjugate $\bar{z} = a - ib$ • Perform arithmetic of complex numbers (addition, subtraction, multiplication and division) to form a number complex number in the form $a + ib$ • Solve quadratic equations with non-real roots • Find reciprocals and square roots of complex numbers • Represent and plot complex numbers on the Complex Plane • Define the modulus r and argument θ of a complex number	• Represent and use complex numbers in polar or mod-arg form $z = r(cos\theta + i\,sin\theta)$ • Prove and use basic modulus and argument identities • Geometrically perform arithmetic of complex numbers in polar form • Understand Euler's formula $e^{ix} = cos\,x + i\,sin\,x$ • Represent and use complex numbers in exponential form $z = re^{i\theta}$ • Convert between Cartesian, polar and exponential forms • Find powers of complex numbers in exponential form • Solve problems involving complex numbers
Note that some concepts assessed in this task may rely on your knowledge of Advanced and Extension 1 techniques, particularly in the areas of:	
Algebra and Surds	Polynomials

2. WHY IS THE COMPLETION OF THIS ASSESSMENT IMPORTANT?

- This task will draw together the above outcomes and assess a range of mathematical skills and techniques that you have covered in class.
- The structure and questioning style presented in this task will mirror that of the HSC examination.
- You will be required to apply your knowledge to a series of unseen questions require you to problem-solve solutions.
- It will be used by you and your teachers to assess your knowledge and understanding of the course outcomes, allowing you to refine your skills in preparation for the HSC examination.

3. WHAT STEPS DO I TAKE TO COMPLETE THIS TASK?

Task Outline

This is a 1 period in class test. This task will be completed in exam conditions in class on **Thursday 12th December** (Period 0), during your regular timetabled lesson. A HSC Reference Sheet will also be provided.

The examination consists of the following two compulsory sections:

- **Section 1: Multiple-Choice**. This section contains 5 multiple-choice questions worth 1 mark each covering a range of the concepts listed in the Areas of Learning above. These must be answered on the multiple choice answer sheet in your answer booklet. You should allow **8 minutes** to complete this section.

- **Section 2: Written Response.** This section contains a series of questions, some with parts worth a total of 24 marks. The questions will be a mixture of short and long response questions worth 1 mark or more covering a range of the concepts listed in the Areas of Learning above. You should allow **40 minutes** to complete this section. You need to complete your answers in the space provided under each question. All necessary working must be shown for this section.

Preparation for this Task

As this is an examination you will need to prepare for this task by:

- Creating your summary notes page covering each topic listed above (you can use mind maps, flow charts, dot point lists).
- Regularly complete practice examination questions.
- Seeking teacher assistance on unclear work.
- Ensuring all set work is up to date.

Details for Submission

For successful completion of this examination you must bring the following equipment.

- Board approved calculator
- Blue or black pen,
- Pencils and eraser for graphs
- A ruler

Students who are absent from the examination, or have a legitimate reason for missing the task, must notify the school before the exam commences. To avoid a zero mark being awarded, any absence must be supported by valid misadventure/illness documentation as outlined in the Year 12 Assessment Booklet.

You will also need to complete a self-reflection on your assessment that is to be submitted to your teacher after receiving the solutions. This is to assist you and your teacher in refining your knowledge, skills and examination technique for future assessments.

4. HOW WILL MARKS BE AWARDED TO MEASURE MY LEARNING?

Worked solutions with marking criteria for each question will be provided when the exam is marked and returned. You should ensure that you go through these solutions thoroughly to correct your mistakes and ask your teacher if there is anything you are unsure about.