# Pre-approved Learning and Assessment Plan

Stage 2 Specialist Mathematics (aligns with Program 1)

Pre-approved learning and assessment plans are for *school use only*.

* Teachers may make changes to the plan, retaining alignment with the subject outline.
* The principal or delegate endorses the use of the plan, and any changes made to it, including use of an addendum.
* The plan does not need to be submitted to the SACE Board for approval.

|  |  |  |  |
| --- | --- | --- | --- |
| School |  | Teacher(s) |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SACE school code | | |  | Year |  | Enrolment code | | | | |  | Program variant code (A–W) |
| Stage | Subject code | | | No. of credits (10 or 20) |
|  |  |  |  | **2** | **M** | **S** | **C** | **20** |  |

Addendum – changes made to the pre-approved learning and assessment plan

|  |
| --- |
| Describe any changes made to the pre-approved learning and assessment plan to support students to be successful in meeting the requirements of the subject. In your description, please explain:  what changes have been made to the plan   * the rationale for making the changes * whether these changes have been made for all students, or for individuals within the student group. |

Endorsement

The use of the learning and assessment plan is approved for use in the school. Any changes made to the plan support student achievement of the performance standards and retain alignment with the subject outline.

|  |  |  |  |
| --- | --- | --- | --- |
| Signature of principal or delegate |  | Date |  |

# Assessment overview

Stage 2 Specialist Mathematics – 20 credits

The table below provides details of the planned tasks and shows where students have the opportunity to provide evidence for each of the specific features of all of the assessment design criteria.

Assessment Type 1: Skills and Applications Tasks – weighting 50%

|  |  |  |  |
| --- | --- | --- | --- |
| Assessment details | Assessment design criteria | | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
| CT | RC |
| SAT 1: Mathematical Induction – Students demonstrate mathematical knowledge and skills from subtopic 1.1 covering proof by mathematical induction.  Students show their understanding of the nature of inductive proof in both routine and complex questions. Students are required to formulate and test conjectures.  The complex questions require students to apply the key concepts to solve problems. Clear and logical communication of solutions and correct use of notation and terminology are required. | 1,2 | 1,3,4,5 | Supervised written assessment  No calculator permitted  No handwritten notes  Total time: 45 minutes |
| SAT 2: Complex Numbers – Key questions and key concepts from subtopics 2.1 to 2.4 of Topic 2 will be assessed in a variety of contexts.  SAT 2 is divided into two parts. Part 1 will be completed without a calculator or notes and for Part 2 students have access to appropriate technology and notes. Students commence the SAT with both parts of the task (non-calculator and calculator) but will not have access to a calculator or notes until Part 1 is collected.  Construction of graphical representations may be required to support their problem-solving strategies. Clear and logical communication of solutions and correct use of notation and terminology are required. | 1,2,4 | 1,3,4 | Supervised written assessment  Total Time: 60 minutes  Part 1 : 25 minutes  No calculator or notes permitted  Part 2 : 35 minutes  Access to graphics calculator and 1 A4 page of handwritten notes permitted |
| SAT 3: Functions and Sketching Graphs – This assessment will cover key questions and key concepts from throughout Topic 3.  SAT 3 is divided into two parts. Part 1 will be completed without a calculator or notes and for Part 2 students have access to appropriate technology and notes. Students commence the SAT with both parts of the task (non-calculator and calculator) but will not have access to a calculator or notes until Part 1 is collected.  Construction of graphical representations is required to support their problem-solving strategies. Use of mathematical induction allows for the assessment of RC5.  Appropriate and effective use of electronic technology is expected. Clear and logical communication of solutions and correct use of notation and terminology are required. | 1,2,4 | 1,3,4,5 | Supervised written assessment  Total Time: 55 minutes  Part 1 : 30 minutes  No calculator or notes permitted  Part 2 : 25 minutes  Access to graphics calculator and 1 A4 page of handwritten notes permitted |
| SAT 4: Integration Techniques and Applications – Key questions and key concepts from all subtopics within Topic 5 will be covered in this assessment.  Both routine and complex questions requiring students to apply known identities to solve problems in a variety of contexts and applications will be provided. Appropriate and effective use of electronic technology is expected.  Clear and logical communication of solutions and correct use of notation and terminology are required. | 1,2,4 | 1,3,4 | Supervised written assessment  Graphics calculator permitted  1 A4 page of handwritten notes  Total time:55 minutes |
| SAT 5: Vectors in 3D – Students demonstrate mathematical knowledge and skills in a range of routine and complex questions covering subtopics 4.1 to 4.3.  The complex questions require students to apply the key concepts to solve problems in a variety of contexts, some of which require interpretation of the results. The sections on Vector Proof and the Triangle Inequality offer opportunities for conjecture and proof scenarios.  Appropriate and effective use of electronic technology is expected. Clear and logical communication of solutions and correct use of notation and terminology are required. | 1,2,4 | 1,3,4,5 | Supervised written assessment  Graphics calculator permitted  1 A4 page of handwritten notes  Total time: 60 minutes |
| SAT 6: Rates of Change and Differential Equations – Students demonstrate mathematical knowledge and skills from Topic 6. The content covers key questions and key concepts within subtopics 6.1 to 6.5.  The complex questions require students to apply concepts to solve problems in a variety of contexts and applications. Construction of graphical representations may be required to support their problem-solving strategies. Appropriate and effective use of electronic technology is expected. Clear and logical communication of solutions and correct use of notation and terminology are required. | 1,2,4 | 1,2,3,4 | Supervised written assessment  Graphics calculator permitted  1 A4 page of handwritten notes  Total time: 70 minutes |

Assessment Type 2: Mathematical Investigation – weighting 20%

|  |  |  |  |
| --- | --- | --- | --- |
| Assessment details | Assessment design criteria | | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
| CT | RC |
| Design of Wine and Champagne Glasses – This investigation is requires students to use knowledge of trigonometric functions and key concepts from subtopic 5.2. Students create trigonometric functions to model the design of each style of glass with the stipulation that the glasses have approximately equal cross section areas. The volumes are then calculated for comparison. Students consider the reasonableness of their solutions and the opportunity for extension work is provided. | 1,2,3, 4 | 1,2,3,4 | Appropriate investigation report format as described in the Specialist Mathematics subject outline.  Maximum of 15 single-sided A4 pages.  3 weeks to complete. Some class time is allowed to support verification. |

External Assessment: Examination – weighting 30%

|  |  |
| --- | --- |
| Assessment details | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
|
| External Assessment | 2-hour external examination (from November 2020).  Access to approved electronic technology required.  Students may refer to two unfolded A4 sheets (four sides) of hand-written notes.  A formula sheet is included in the examination booklet.  The examination is based on the key questions and key concepts in the six topics.  The examination consists of a range of problems, some focusing on knowledge and routine skills and applications, and others focusing on analysis and interpretation. Some problems may require students to interrelate their knowledge, skills, and understanding from more than one topic. Students provide explanations and arguments, and use correct mathematical notation, terminology, and representations throughout the examination. |

Eight assessments.Please refer to the Stage 2 Specialist Mathematics subject outline.