

Mathematical Methods GA 1: Unit 3 and 4 Coursework

GENERAL COMMENTS

The study design describes the tasks to be undertaken by students for the School-assessed Coursework. These tasks are to be a part of the regular teaching and learning program. In addition to this, the *Assessment Guide VCE 2001: Mathematics and Revised VCE Studies 2000 Implementation Resource Kit* and other materials provide advice on how this can be implemented in schools.

Unit 3 Coursework

For Unit 3, students complete:

- a functions and calculus application task with several components of increasing complexity, relating to all three outcomes, with an emphasis on Outcome 2
- two tests that relate to Outcomes 1 and 3.

Most School-assessed Coursework was implemented in accordance with the requirements of the study design, and teachers used their own ideas and the many available resources to develop suitable tasks.

Application task

Generally, teachers followed the requirements of the study design and the advice of the Mathematics assessment guide. In 2002 there were more original tasks than in previous years as teachers continue to draw on past 'Investigative projects' skilfully. It is expected that the task is completed in about 360–450 minutes, mainly in class time, and this was generally the case. Tasks were of suitable standard for Unit 3 Mathematical Methods, and students usually were able to demonstrate achievement of key knowledge and skills related to the outcomes.

Students need to have a clear understanding of what constitutes an application task and be advised that their work should only be in the range of 800–1200 words and 6–12 pages. A logbook is required and teachers should explain the appropriate use of the logbook. There was a significant use of technology with the most common tool being the graphics calculator due to ready access during class time. A cover sheet provided with the task was rarely evident. In individual cases the scope of the task and the level of complexity were not sufficient to satisfy the requirements of the time specified in the study design.

Tests

Generally, tests were structured in a format similar to end-of-year examinations, in particular Examination 1. Teachers made good use of past examination questions as a source of ideas in constructing their tests, and nearly all tests conformed to the description of the study design and the assessment advice. It is advised, however, that the questions, both multiple-choice and short-answer be selected with some an increasing level of complexity rather than testing the most difficult aspects of the topics covered. In particular tests provide a good opportunity to assess easier material covered for the first time in Unit 3. Many teachers provided a detailed cover sheet with clear instructions of the conditions and the requirements of the tests as well as the marking scheme and criteria for assessment. Students should receive constructive feedback on individual areas for review and consolidation.

Unit 4 Coursework

Students complete two separate analysis tasks and these should be:

- conducted mainly in class over several periods
- one of the four types specified by the study design
- (one task to be) related to the Statistics and Probability area of study
- be of different type
- covering three outcomes.

In most schools, suitable tasks were developed in accordance with the Mathematics study design as teachers followed the specifications and tasks often drew on support material from the VCAA and previous examinations.

In very few cases, there was some misinterpretation of the type of task where the opportunity for students to produce mathematical results (for example, calculations, tables, graphs and diagrams) and then analyse and interpret these results was not provided.

Teachers preferred setting types of analysis tasks that could be structured to provide review towards examinations. Most students completed tasks in an appropriate amount of class time, and the content of those tasks reflected the expected levels of Mathematical Methods Units 3 and 4. Teachers need to ensure that the design of analysis tasks gives students the time and scope of material specified by the study design.

Some confusion remains evident with the formulation of *Item Response Analysis* tasks, i.e. completing a collection of five conventional option multiple-choice questions with a single letter response does **not** constitute an item response analysis task. While a set of multiple-choice questions could form the **basis** for such a task, it is expected that students demonstrate their ability to **analyse** alternative responses for a given set of items.

Suitable approaches for dealing with the item response analysis task are those that require students to:

- show all working out for the correct response
- justify or show why the other responses are incorrect
- compare and critically analyse the wording of the question and its effect
- explain errors in a particular process
- re-word the original question in order to obtain an alternative answer.

In many cases there were informative, clear directions for tasks with teachers including a cover sheet stating precise directions on the conduct of each task, providing students with information on the time allocation and method of assessment. Students should be aware of these conditions well before the conclusion of the task.

The use of technology was evident in most cases, although sometimes not explicit enough. All analysis tasks should have components that rely on the use of technology. In most cases graphics calculators were used; however, there were examples of the use of computer programs in particular for graphing.

Overall, teachers make good use of the VCAA criteria for assessment recommended in the resource kit and assessment guide and developed an efficient and effective process of assessment based on the three outcomes. Teachers could pay closer attention to key knowledge and skills for outcome-based assessment, and attempt to clearly outline the process they have used in doing so with the use of suitable criteria to assist in the more comprehensive assessment of student work.

Coursework – task tallies

GA type	Component	Task ID	Count	%	Description
Coursework Unit 3/4	1	1	18041	ALL	Application task
Coursework Unit 3/4	2	1	18086	ALL	Two tests (mixed question types)
Coursework Unit 3/4	3	1	5581	15.7	Assignment
Coursework Unit 3/4	3	2	6155	17.3	Investigation/problem/task
Coursework Unit 3/4	3	3	15422	43.4	Application questions
Coursework Unit 3/4	3	4	8413	23.7	Item response analysis