

Specialist Mathematics: Unit 4 Coursework

GENERAL COMMENTS

The first year of the Revised VCE Specialist Mathematics has confirmed the professional manner in which teachers across Victoria implemented the Study Design. The introduction of coursework assessment required significant effort in planning, preparing, conducting and assessing the three types of tasks for students during the year.

There was a very high degree of compliance with the requirements and intentions described in the *VCE Study Design: Mathematics*, the *Assessment Guide VCE 2000: Mathematics*, and the *Revised VCE Studies 2000 Implementation Resource Kit*.

Students were required to demonstrate achievement over a set of three outcomes to:

- define and explain key concepts as specified in the content from the ‘Coordinate geometry’, ‘Circular (trigonometric) functions’, ‘Calculus’, ‘Algebra’ and ‘Statistics and Probability’ areas of study, and to apply a range of related mathematical routines and procedures
- apply mathematical processes in non-routine contexts and to analyse and discuss these applications of mathematics
- select and appropriately use technology to develop mathematical ideas, produce results and carry out analysis in situations requiring problem-solving, modelling or investigative techniques or approaches.

The *Assessment Guide Revised VCE 2000* booklet provided clear advice as to how the assessment program should be developed. The assessment should be conducted mainly in class so as to avoid the excessive time sometimes spent previously on the extended Common Assessment Tasks (CATs) and to avoid problems associated with authentication. Use of logbooks that could easily be monitored by the class teacher also made the authentication of student work simpler.

SPECIFIC INFORMATION

Unit 3 revisited

In Unit 3 students were required to complete two analysis tasks, each of a different type, selected from the following:

- an assignment where students have the opportunity to work on a broader range of problems
- a short and focused investigation, challenging problem or modelling task
- a set of application questions requiring extended response analysis in relation to a particular topic or topics
- item response analysis for a collection of multiple-choice questions.

There was ample evidence that teachers were comfortable with setting and assessing the first three of these types. Analysis tasks were set using ideas and approaches drawn from past CATs and other resources (produced by the Board of Studies), as well as textbooks and other commercial resources. There were a considerable number of teachers who produced excellent original tasks. Familiarity with these three types of tasks meant that the criteria for each outcome were clearly demonstrated in both the task set and the student responses.

The item response analysis type of task was less well developed. The best were characterised by the manner and structure of the teacher’s presentation of the task to the students. A good approach provided each multiple-choice question on a separate page in table format, giving sufficient space for students to include calculations and sketch graphs as needed and clearly indicated the expectation of a detailed comment on each of the responses, not just the choice of the correct answer. The challenge for teachers is to provide students with the opportunity to demonstrate their knowledge and skills with respect to the outcomes. This type of task requires sound analysis skills from the students and excellent skills in communicating

mathematically. These skills need to be developed over a period of time to provide good preparation for Examination 1 in November. Better responses included detailed analysis and showed understanding of the common errors made by students. This type of task was less frequently set by teachers and it was disappointing that in some cases the work was only a short multiple-choice test, not an analysis task requiring students to complete 160–200 minutes of work.

Unit 4

Students were required to complete an application task over two weeks and two tests, which could include suitable questions similar to those in the November examinations.

Teachers used past problem-solving CAT 1 topics, the advice published in the December 2000 *VCE Bulletin*, various sample materials and resources from the Maths Association of Victoria and other agencies, to assist them in developing the application task. Tasks set were appropriate both in terms of content covered and the depth of analysis required. There were no excessive responses seen and little time consuming word processing. The coursework was not the ‘polished’ presentations of previous years, but there was ample evidence of excellent student learning, along with demonstration of outstanding analytical work and effective use of technology.

The content and quality of the tests set by teachers were generally of a good standard, covering appropriate material and were likely to assist students in their review of this material and their preparation for the November examinations. In a few cases the tests were too short; ten multiple-choice questions alone are not sufficient for a 40–50 minutes test. Items from Examination 1 (multiple-choice and short-answer) and elements of Examination 2 (extended-response, progressively more complex) mathematics examination questions, and the time allocated for completion of these tasks should be used as a guide to the dimensions of tasks.

Teachers need to ensure that they provide complete documentation for the students at the commencement of each task. This should include a full description of the conditions under which the task is to be done, such as the time allowed, whether all work is to be done in class, and some indication of the way in which the task will be assessed. Some of the work seen did not include the expected response from students (answers) or marking schemes, nor how assessment criteria had been applied. In other cases there was little or no evidence of subsequent feedback to students. Such feedback is an important aspect of coursework assessment and assists student learning and their review of the work.