# GENERAL COMMENTS

## Grade 12 Applied Mathematics Standards Test (January 2011)

### Student Performance—Observations

The following observations are based on local marking results and on comments made by markers during the sample marking session. These comments refer to common errors made by students at the provincial level and are not specific to school jurisdictions.

Information regarding how to interpret the provincial test and assessment results is provided in the *Interpreting and Using Results from Provincial Tests and Assessments* document available at <www.edu.gov.mb.ca/k12/assess/support/results/index.html>.

Various factors impact changes in performance over time: classroom-based, school-based, and home-based contexts, changes to demographics, and student choice of mathematics course. In addition, Grade 12 provincial tests may vary slightly in overall difficulty although every effort is made to minimize variation throughout the test development and pilot testing processes.

When considering performance relative to specific areas of course content, the level of difficulty of the content and its representation on the provincial test vary over time according to the type of test questions and learning outcomes addressed. Information regarding learning outcomes is provided in the document *Senior 4 Applied Mathematics: A Foundation for Implementation* (2000).

### Total Test

The following chart indicates the provincial test averages for the past six test administrations.

| June 2008 | January 2009 | June 2009 | January 2010 | June 2010 | **January 2011** |
|---|---|---|---|---|---|
| 63.0% | 61.0% | 59.1% | 58.5% | 57.8% | **58.9%** |

### Unit A: Matrices (provincial average: 66.7%)

#### Conceptual knowledge

No comments.

#### Procedural skill

When determining the switching pattern, many students multiplied the transition matrix by a column matrix instead of by a row matrix.

#### Communication (includes technical communication errors)

No comments.

## Unit B: Vectors (provincial average: 67.9%)

### Conceptual knowledge

Instead of placing the vectors head-to-tail when adding the vectors, many students placed them tail-to-tail.

### Procedural skill

No comments.

### Communication (includes technical communication errors)

Many students forgot more than one arrowhead in the scale vector diagrams.

## Unit C: Personal Finance (provincial average: 62.6%)

### Conceptual knowledge

There were many errors when using TVM Solver due to entering "2" instead of "12" ("compounded monthly") for the C/Y value.

### Procedural skill

No comments.

### Communication (includes technical communication errors)

No comments.

## Unit D: Probability (provincial average: 49.8%)

### Conceptual knowledge

No comments.

### Procedural skill

No comments.

### Communication (includes technical communication errors)

Many students did not include the final outcomes when asked to create a sample space.

## Unit E: Variability and Statistical Analysis (provincial average: 50.8%)

### Conceptual knowledge

No comments.

### Procedural skill

No comments.

### Communication (includes technical communication errors)

When asked to determine if a set of data represented a normal distribution, many students only indicated one reason to support their answer instead of two reasons.

## Unit F: Design and Measurement (provincial average: 57.5%)

### Conceptual knowledge

Many students had difficulty knowing which formulas to use in this question. For example, many students used the diameter instead of the radius in their calculations.

### Procedural skill

No comments.

### Communication (includes technical communication errors)

Many students did not buy materials or labour for excavation in whole units.

## Unit G: Periodic Functions (provincial average: 53.5%)

### Conceptual knowledge

Many students had difficulty identifying the period, using a 24-hour cycle instead of a 12-hour cycle.

### Procedural skill

Many students used $x = 4$ instead of $x = 16$ (using a 24-hour cycle instead of a 12-hour cycle) when determining the depth of the water at 4:00 p.m.

### Communication (includes technical communication errors)

When asked to use their knowledge of sinusoidal functions to defend two points of view, many students only defended one point of view.

## Unit H: Sequences (provincial average: 60.5%)

### Conceptual knowledge

No comments.

### Procedural skill

No comments.

### Communication (includes technical communication errors)

No comments.

## Summary of Test Results (Province)

| | |
|---|---|
| Unit A: Matrices | 66.7% |
| Unit B: Vectors | 67.9% |
| Unit C: Personal Finance | 62.6% |
| Unit D: Probability | 49.8% |
| Unit E: Variability and Statistical Analysis | 50.8% |
| Unit F: Design and Measurement | 57.5% |
| Unit G: Periodic Functions | 53.5% |
| Unit H: Sequences | 60.5% |
| Total Test | 58.9% |

## Marking Accuracy and Consistency

Information regarding how to interpret the marking accuracy and consistency reports is provided in the *Interpreting and Using Results from Provincial Tests and Assessments* document available at <www.edu.gov.mb.ca/k12/assess/support/results/index.html>.

These reports include a chart comparing the local marking results to the results from the departmental re-marking of sample test booklets. Provincially, 29.6% of the test booklets sampled were given nearly identical total scores. In 41.4% of the cases, local marking resulted in a higher score; in 28.9% of the cases, local marking resulted in a lower score than those given at the Department. On average, the difference was approximately 1.0% with local marking resulting in the slightly higher average score.

## Survey Results

Teachers who supervised the Grade 12 Applied Mathematics Standards Test in January 2011 were invited to provide comments regarding the test and its administration. A total of 75 teachers responded to the survey. A summary of their comments is provided below.

- 90.7% of the teachers indicated that all of the topics in the test were taught by the time the test was written.

- 100% of the teachers thought that the content of the Inquiry Task and Written Test was consistent with the standards and learning outcomes outlined in the curriculum documents.

- 96.3% of the teachers indicated that their students used a study sheet during the school year and 98.8% indicated that their students used a study sheet during the test.

- 36.4% of the teachers indicated that their students used computers and 9.2% indicated that their students used Internet tools during the test. 97.5% of the teachers indicated that their students used a graphing calculator during the test.

- 95.7% and 82.8% of the teachers, respectively, indicated that students were able to complete the Inquiry Task and Written Test in the time allowed.