
GENERAL COMMENTS

Grade 12 Applied Mathematics Achievement Test (January 2015)

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 document *Interpreting and Using Results from Provincial Tests and Assessments* 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 *Grades 9 to 12 Mathematics: Manitoba Curriculum Framework of Outcomes* (2014).

Summary of Test Results (Province)

January 2014	June 2014	January 2015
62.1%	55.0%	58.2%

Relations and Functions (provincial mean: 51.4%)

Conceptual knowledge

Students determined a linear regression equation using the data even though the question asked for a quadratic regression equation.

Students confused domain and range.

Procedural skill

When asked for the maximum from an equation, some students used the value from their table rather than calculating it.

Communication

Students did not use the variables given in the question, using the general x and y instead.

On certain questions, students did not express their answers to two decimal places when the question asked “how many years.”

When creating a graph, students had an incorrect domain, for example, going into the negative region or only one period instead of two. In some cases, the units were not included on the graph.

Probability (provincial mean: 55.4%)**Conceptual knowledge**

For fundamental counting principles, students did not consider repeated letters in a word.

Procedural skill

Students did not know how to simplify large factorials.

Communication

Students completed one of the steps necessary to solve a question (calculating the total number of possible arrangements) but did not carry on calculating the number of specific cases to obtain the probability.

Financial Mathematics (provincial mean: 67.2%)**Conceptual knowledge**

Students did not refer to 32% in their explanation of GDSR-based decisions.

Students confused debt-to-equity ratio with gross debt service ratio.

Procedural skill

Students did not divide salary or property tax by 12 to determine average monthly cost.

Students did not account for payments to a credit card during an interest-free period or they did but did not add these months back when asked for the total number of months.

Students expressed their final answer incorrectly. For example, they gave the number of years in which the money was invested rather than the person’s age (given the person’s age at the start of the investment).

Students did not interpret or had difficulty explaining data presented on graphs.

Communication

Answers in this unit involving monetary values must always be stated in dollars and cents.

Design and Measurement (provincial mean: 62.4%)

Conceptual knowledge

Students misinterpreted the dimensions (length) with area.

Procedural skill

Pieces of a structure were omitted or determined incorrectly in calculation.

Sales taxes were miscalculated.

For the calculation involving determining the volume of a small shape from a larger one, students only calculated one of the volumes instead of subtracting the smaller from the larger.

Communication

Rounding too soon affected the calculation of the final answer.

Logical Reasoning (provincial mean: 64.0%)

Conceptual knowledge

Students left out the value that represented the “neither/nor” (e.g., neither chocolate nor vanilla) out of the Venn diagram.

Students identified a statement as biconditional, but included a definition and explanation of a biconditional statement, but not writing the biconditional of the original statement.

Procedural skill

No comments.

Communication

Students often created their own names for subsets or elements from the universal set instead of writing out the subsets.

Communication Errors

Errors that are not related to the concepts within a question are called “Communication Errors” and these were indicated on the *Scoring Sheet* in a separate section. There was a maximum 0.5 mark deduction for each type of communication error committed, regardless of the number of errors committed for a certain type (i.e., committing a second error for any type did not further affect a student’s mark).

The following table indicates the percentage of students who had at least one error for each type.

E1	Notation	16.3%
E2	Units	22.2%
E3	Transcription/Transposition	18.1%
E4	Final Answer	25.0%
E5	Rounding	57.0%
E6	Whole Units	3.4%

Marking Accuracy and Consistency

Information regarding how to interpret the marking accuracy and consistency reports is provided in the document *Interpreting and Using Results from Provincial Tests and Assessments* 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, 44.7% of the test booklets sampled were given nearly identical total scores. In 39.7% of the cases, local marking resulted in a higher score than those given at the department; in 15.6% of the cases, local marking resulted in a lower score. On average, the difference was approximately 1.4% with local marking resulting in the slightly higher average score.

Survey Results

Teachers who supervised the Grade 12 Applied Mathematics Achievement Test in January 2015 were invited to complete a feedback form regarding the test and its administration. A total of 78 forms were received. A summary of their comments is provided below.

After adjusting for non-responses:

- 90% of the teachers indicated that all of the topics in the test were taught by the time the test was written.
- 89% of the teachers thought that the test content was consistent with the learning outcomes outlined in the curriculum documents and 86% thought that the difficulty of the test was appropriate.
- 96% of the teachers indicated that their students used a study sheet during the semester and 84% of the teachers indicated that all of their students used a study sheet during the test. 71% of the teachers indicated that the study sheets were made during class.
- 81% of the teachers indicated that all of their students used the formula sheet during the semester and 88% of teachers indicated that their students used the formula sheet during the test.
- During the test, 89% of the teachers indicated that all of their students used a graphing calculator, 9% of the teachers indicated that at least some of their students used computer software, and 11% indicated that at least some of their students used Internet tools.
- 91% of the teachers indicated that students were able to complete the test in the time allowed.