MATHEMATICS

MTH-4059-1 The Four Operations on Algebraic Fractions

DEFINITION OF THE DOMAIN FOR SUMMATIVE EVALUATION

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1. INTRODUCTION

This definition of the domain for summative evaluation describes and classifies the essential and representative elements of the *Mathematics* program, and more specifically of the *Four Operations on Algebraic Fractions* module. As such, it gives an overview of the program, but should by no means replace the program itself. The purpose of defining the domain is to ensure that all summative evaluation instruments are consistent with the overall program.

The definition of the domain for summative evaluation for each module in this program is organized in a similar manner; however, the content of this definition of the domain is specific to the *Four Operations on Algebraic Fractions* module.

The goal of the definition of the domain for summative evaluation is to prepare examinations that are valid from one version to another, from year to year, and from one school board to another, taking into account the responsibilities shared by the ministère de l'Éducation and the school boards.

2. PROGRAM ORIENTATIONS AND CONSEQUENCES FOR SUMMATIVE EVALUATION

Orientations	Consequences
The main purpose of the adult education secondary level *Mathematics* program is to help adults understand the mathematical concepts needed to solve problems related to everyday situations, expand their knowledge of mathematics and, ultimately, facilitate access to a future career. Consequently, in the program, mathematics is presented as a practical tool for solving common, real-life problems.	Evaluation items should deal with either original and practical situations taken from everyday life or those associated with an occupation.
Another area of development emphasized in the program involves mastering the mathematical operations used in science and technology for processing the kind of information students encounter in their daily lives, and which enables them to understand various everyday phenomena in terms of quantities and relations. In developing these skills, the *Mathematics* program can also prepare interested adults for studies leading to a career in science.	Evaluation items should also pertain to situations in the fields of science or mathematics.
Whether the aim is to enable students to solve practical problems or to orient them towards a career in science, all the learning activities in the program emphasize the acquisition of a systematic work method.	Evaluation should measure the adult's ability to follow the steps involved in solving a problem. It should also verify whether or not the student has mastered a work method.
The program also places emphasis on mastering the use of a calculator or a microcomputer in the classroom. This particular area of development, as well as the growing importance of the international metric system (SI) in the life of each individual are addressed throughout the different learning activities.	The use of a calculator is permitted.

3. CONTENT OF THE PROGRAM FOR PURPOSES OF SUMMATIVE EVALUATION

Concepts

- Simplifying simple algebraic fractions
- Multiplying algebraic fractions
- Dividing algebraic fractions
- Adding algebraic fractions
- Subtracting algebraic fractions
- Series of operations

Skill

Each skill is defined within the context of a mathematics program. Given that the adult education *Mathematics* program harmonizes with the mathematics programs in the youth sector, the skills involved are the same for students in both sectors.

OPERATING	Performing a given operation or transformation. *Possible actions:* to calculate, construct, break down, perform, estimate, evaluate, isolate, measure, reconstruct, solve, draw, transform, verify, and so on.

4. TABLE OF DIMENSIONS

CONCEPTS / SKILL	THE FOUR OPERATIONS ON ALGEBRAIC FRACTIONS	SERIES OF OPERATIONS INVOLVING ALGEBRAIC EXPRESSIONS
	50 %	50 %
OPERATING	Simplification of simple algebraic fractions **1** 10 %	Simplification of algebraic expressions, following the order of operations.
	Multiplication, division of algebraic fractions **2** 20 %	
100 %	Addition, subtraction of algebraic fractions **3** 20 %	**4** 50 %

Note: The numbers **1** to **4** identify the dimensions.

5. OBSERVABLE BEHAVIOURS

Examination items should be formulated on the basis of the observable behaviours listed below. The requirements and restrictions specified in the objectives of the program must be observed.

Dimension 1
To reduce an algebraic fraction to its lowest terms. The numerator and denominator of this algebraic fraction are factorable polynomials.

Dimension 2
To simplify an algebraic expression containing algebraic fractions that are multiplied and divided.

Dimension 3
To simplify an algebraic expression containing algebraic fractions that are added and subtracted.

Dimension 4
To simplify an algebraic expression containing algebraic fractions, following the order of operations.

6. JUSTIFICATION OF CHOICES

The objectives of this module reflect a concern for helping students master various mathematical skills. In this case, students develop their **operating** skills.

It is also important that students be able to use a systematic procedure to simplify algebraic expressions.

The weighting of the skills is based on the program itself and on the time normally required to master these skills. In this case, operating skills are the sole focus of summative evaluation.

The two following themes have been given equal emphasis in this module: the four operations on algebraic fractions and problems involving a series of operations on algebraic fractions. The themes have thus been weighted as follows:

THE FOUR OPERATIONS ON ALGEBRAIC FRACTIONS	50%
SERIES OF OPERATIONS INVOLVING ALGEBRAIC FRACTIONS	50%

7. DESCRIPTION OF THE EXAMINATION

A. TYPE OF EXAMINATION

There shall be a written examination consisting mostly of items that will be scored subjectively (free-response or extended-response items). Some items may be scored objectively.

B. CHARACTERISTICS OF THE EXAMINATION

- The examination must be taken in one session lasting no more than two hours.
- The distribution of the marks should be consistent with the percentages indicated in the table of dimensions.
- Students are permitted to use a calculator.
- The items must reflect the requirements and restrictions outlined in the objectives of the program.

C. PASS MARK

The pass mark is set at 60 out of 100.

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