

MATHEMATICS

MTH-4060-1 Straight Lines II

**DEFINITION OF THE DOMAIN FOR
SUMMATIVE EVALUATION**

NOVEMBRE 1997

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Ministère de l'Éducation, 1997 — 97-0617

ISBN 2 - 550 - 32239-8

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TABLE OF CONTENTS

	Page
1. Introduction	1
2. Program Orientations and Consequences for Summative Evaluation . . .	2
3. Content of the Program for Purposes of Summative Evaluation	3
4. Table of Dimensions	4
5. Observable Behaviours	5
6. Justification of Choices	6
7. Description of the Examination	7

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 *Straight Lines II* 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 *Straight Lines II* 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

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.

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.

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.

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.

Consequences

Evaluation items should deal with either original and practical situations taken from everyday life or those associated with an occupation.

Evaluation items should also pertain to situations in the fields of science or mathematics.

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 use of a calculator is permitted.

3. CONTENT OF THE PROGRAM FOR PURPOSES OF SUMMATIVE EVALUATION

Concepts

Equation of a Line

- Equation of a line
- Equations of parallel lines
- Equations of perpendicular lines

Distance

- Distance between two points
- Distance between a point and a line

Division of a line segment

- Point dividing a line segment

Skills

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.

STRUCTURING	Being familiar with the fundamentals of mathematics, understanding some mathematical concepts, establishing some cognitive relations. <i>Possible actions:</i> to associate, classify, compare, complete, describe, define, distinguish, state, enumerate, group, name, order, organize, rank, recognize, arrange, and so on.
OPERATING	Performing a given operation or transformation. <i>Possible actions:</i> to calculate, construct, break down, perform, estimate, evaluate, isolate, measure, reconstruct, solve, draw, transform, verify, and so on.
ANALYZING OR SYNTHESIZING	Establishing a link between a given solution and a problem or finding a solution to a given problem. <i>Possible actions:</i> to conclude, deduce, derive, explain, extrapolate, infer, justify, prove, solve, transfer, and so on.

4. TABLE OF DIMENSIONS

CONCEPTS SKILLS	EQUATION OF A LINE 35 %	DISTANCE 35 %	DIVISION OF A LINE SEGMENT 30 %
STRUCTURING 5 %	Equations of parallel and perpendicular lines 1 5 %		
OPERATING 50 %	Equation, given a point and a parallel line 2 15 %	Distance between two points 4 10 %	Point dividing a line segment 6 10 %
	Equation, given a point and a parallel line 3 15 %		
ANALYZING OR SYNTHESIZING 45 %		Problem relating to everyday situations 5 25 %	Problem relating to everyday situations 7 20 %

Note: The numbers **1** to **7** 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 identify parallel and perpendicular lines, given equations of the form $y = mx + b$.

Dimension 2

To determine the equation of a line, given one of its points and the equation of a line parallel to it.

Dimension 3

To determine the equation of a line, given one of its points and the equation of a line perpendicular to it.

Dimension 4

To calculate the distance between two given points.

Dimension 5

To solve problems relating to everyday situations that involve calculating the distance between two points.

Dimension 6

To determine the point that divides a line segment in a particular ratio.

Dimension 7

To solve problems relating to everyday situations that involve determining the point that divides a line segment in a particular ratio.

6. JUSTIFICATION OF CHOICES

Given that the program focuses on helping students learn how to use various mathematical skills to solve practical problems in everyday situations, emphasis has been placed on the skills needed to solve these problems: **operating** and **analyzing**.

Since it is also important that students be able to use a systematic procedure to solve a word problem, they should clearly understand the steps involved in solving a problem.

The weighting of the skills listed below is based on the program itself and on the time normally required to master these skills.

STRUCTURING	5%
OPERATING	50%
ANALYZING OR SYNTHESIZING	45%

Three different themes relating to straight lines are examined in this module and have been weighted as follows:

EQUATION OF A LINE	35%
DISTANCE BETWEEN TWO POINTS	35%
DIVISION OF A LINE SEGMENT	30%

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 and a geometry set.
- 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.

