

*Definition of the Domain  
for Summative Evaluation*

MTH-4103-1

# Mathematics Trigonometry I

Right Triangles and any Given Triangle

Québec 

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for Summative Evaluation*

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# Mathematics Trigonometry I

**Right Triangles and any Given Triangle**

Formation professionnelle et technique  
et formation continue

Direction de la formation générale  
des adultes

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Ministère de l'Éducation, 2004 — 04-00810

ISBN 2-550-43542-7

Legal deposit — Bibliothèque nationale du Québec, 2004

## 1. INTRODUCTION

This Definition of the Domain for Summative Evaluation describes and classifies the essential and representative elements of the secondary-level adult education Mathematics program and, more specifically, of the course entitled Trigonometry I (Right Triangles and Any Given Triangle). 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 course in this program is organized in a similar manner; however, the content of this definition of the domain is specific to the course entitled Trigonometry I (Right Triangles and Any Given Triangle).

The goal of the Definition of the Domain for Summative Evaluation is to prepare examinations that are valid from one version to another or 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 objective of the secondary-level adult education Mathematics program is to help students fully understand mathematical concepts.

The program is designed to help students master the use of certain mathematical tools used in the field of science and technology or in different trades.

The program aims to provide students with the skills they need to process information by applying mathematical models and appropriate strategies for solving problems.

The program also aims to improve the students' ability to clearly relate information using mathematical language.

The program is intended to help students develop a systematic work method.

The program will help students master the use of technological tools.

### CONSEQUENCES

Evaluation should involve verifying whether the student has fully understood the different concepts.

Evaluation items should pertain to situations in the field of science and technology or to situations related to trades.

Evaluation items should involve performing tasks that require the students to classify information, use mathematical models and solve problems.

Evaluation items should involve performing tasks that require the use of mathematical language. The appropriateness and clarity of the language used should be taken into account in the marking process.

Evaluation items should require the students to present their work in a clear and structured manner. This should be taken into account in the marking process.

The use of a scientific calculator is permitted for the examinations related to this course.

### 3. CONTENT OF THE PROGRAM FOR PURPOSES OF SUMMATIVE EVALUATION

#### Concepts

- Right triangles
  - trigonometric ratios
- Any given triangle
  - law of sines
  - law of cosines

#### Skills

Each skill is defined within the context of a mathematics program. Given that the adult education Mathematics program corresponds to 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 cognitive relations.

Possible actions: to associate, classify, compare, complete, describe, define, contrast, distinguish, state, enumerate, group, name, rank, organize, recognize, arrange, and so on.

**Mathematizing**      Interpreting a given situation using a mathematical model (arithmetic, algebraic or graphical).

Possible actions: to formalize, illustrate, represent, schematize, symbolize, translate, transpose, and so on.

**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.

**Analyzing or synthesizing**      Establishing a link between a problem and a given solution or finding a solution to a given problem.

Possible actions: to conclude, deduce, derive, explain, extrapolate, infer, justify, prove, solve, transfer, and so on.

#### 4. TABLE OF DIMENSIONS

| CONCEPTS                                    | RIGHT TRIANGLES                                        | ANY GIVEN TRIANGLE                              |
|---------------------------------------------|--------------------------------------------------------|-------------------------------------------------|
| SKILLS                                      | 80%                                                    | 20%                                             |
| <b>STRUCTURING</b><br>5%                    | Trigonometric ratios<br><br>1 5%                       |                                                 |
| <b>MATHEMATIZING</b><br>5%                  | Trigonometric ratios<br><br>2 5%                       |                                                 |
| <b>OPERATING</b><br>40%                     | Measures of angles or<br>lengths of sides<br><br>3 30% | Law of sines and law of<br>cosines<br><br>5 10% |
| <b>ANALYZING OR<br/>SYNTHESIZING</b><br>50% | Word problems<br><br>4 40%                             | Word problems<br><br>6 10%                      |

Key: The numbers 1 to 6 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 dimensions and the objectives of the program must be observed.

### Dimension 1

Identify the different trigonometric ratios.  
(structuring)

/5

### Dimension 2

Determine a trigonometric ratio in a right triangle, given its two other trigonometric ratios.  
(mathematizing)

/5

### Dimension 3

Determine the unknown dimensions of a right triangle, given the lengths of two sides of the triangle, or the length of one side and the measure of one acute angle.  
(operating)

/30

### Dimension 4

Solve word problems that involve applying trigonometric ratios to right triangles.  
(synthesizing)

/40

### Dimension 5

Using the law of sines or the law of cosines, determine the unknown dimensions of any given triangle.  
(operating)

/10

### Dimension 6

Solve a word problem that involves applying the law of sines or the law of cosines to any given triangle.  
(synthesizing)

/10

## 6. JUSTIFICATION OF CHOICES

Given that the program focuses on helping the students learn how to use various mathematical tools to solve practical problems dealing with everyday situations, the emphasis has been placed on the skills needed to solve such problems: **operating** and **synthesizing**.

Since it is also important that students be able to follow 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 the time normally required to master these skills.

|                           |     |
|---------------------------|-----|
| STRUCTURING               | 5%  |
| MATHEMATIZING             | 5%  |
| OPERATING                 | 40% |
| ANALYZING OR SYNTHESIZING | 50% |

Similarly, with regard to the concepts, the study of trigonometric ratios in right triangles figures prominently in this course. The concepts have thus been weighted as follows:

|                    |     |
|--------------------|-----|
| RIGHT TRIANGLES    | 80% |
| ANY GIVEN TRIANGLE | 20% |

## **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.

The items should take into account the restrictions and the requirements specified in the dimensions and the objectives of the program. The weighting of marks should be consistent with the percentages set out in the table of dimensions.

### **B. CHARACTERISTICS OF THE EXAMINATION**

The examination will be administered in a single session lasting no more than two and a half hours.

Students are permitted to use a scientific calculator and a trigonometric table. However, they are not permitted to use a graphing calculator.

### **C. PASS MARK**

The pass mark is set at 60 out of 100.

