

DEFINITION OF THE EVALUATION DOMAIN

Adult General Education

Diversified Basic Education Program

Mathematics

OPTIMIZATION IN A GENERAL CONTEXT

MTH-5150-2

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Table of Contents

Introduction	1
Evaluation Content	2
Explanation of the Evaluation Content	3
Evaluation Criteria	3
Proficiency in Subject-Specific Knowledge	3
Weighting	4
Knowledge	4
Specifications for the Evaluation Instruments	5
Examination: Number of Parts, Sections, Procedure and Duration	5
Examination Content	5
Information-Gathering Tools	5
Authorized Materials.....	5
Assessment Tools	6
Pass Mark	6
Retakes	6

Introduction

The Definition of the Evaluation Domain (DED) ensures consistency between a course and the related evaluation instruments. The DED is used to select, organize and describe the essential and representative elements of the course. The DED is based on the program of study and the course, but should by no means replace them in the planning of instructional activities.

All the DEDs produced after June 30, 2014, by the Ministère de l'Éducation et de l'Enseignement supérieur (MEES) are prescriptive. Consequently, they are the reference documents to be used in the development of all examinations, be they ministerial or those developed by adult education centres or by Société GRICS (BIM). The DEDs thus serve as a model for preparing multiple equivalent versions of examinations that are valid across the province.¹

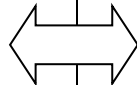
In addition, as set out in the *Policy on the Evaluation of Learning*, adult learners must know what they will be evaluated on and what is expected of them.² The DEDs and the criterion-referenced rubrics (contained in the evaluation instruments) may be used for this purpose.

¹ Québec, Ministère de l'Éducation du Québec, *Policy on the Evaluation of Learning* (Québec: Gouvernement du Québec, 2003), 47.

² *Ibid.*, 9.

Evaluation Content

General Information	
<p>Broad Areas of Learning³</p> <ul style="list-style-type: none"> • Media Literacy • Environmental Awareness and Consumer Rights and Responsibilities <p>Subject Area</p> <ul style="list-style-type: none"> • Mathematics, Science and Technology <p>Family of Situations</p> <ul style="list-style-type: none"> • Optimizing solutions 	<p>Program of Study</p> <ul style="list-style-type: none"> • Mathematics <p>Course</p> <ul style="list-style-type: none"> • Optimization in a General Context
Essential Elements Targeted by the Evaluation	
<p>Subject-Specific Competencies</p> <ol style="list-style-type: none"> 1. Uses strategies to solve situational problems 2. Uses mathematical reasoning 3. Communicates by using mathematical language 	<p>Categories of Knowledge</p> <ul style="list-style-type: none"> • Algebraic expressions • Linear programming • Graph • Finding measurements
Evaluation Criteria	
<p>Evaluation Criteria for Competency 1</p> <ol style="list-style-type: none"> 1.1 Indication (oral or written) that the situational problem has been understood 1.2 Application of strategies and appropriate mathematical knowledge <p>Evaluation Criteria for Competency 2</p> <ol style="list-style-type: none"> 2.1 Correct use of appropriate mathematical concepts and processes 2.2 Proper implementation of mathematical reasoning suited to the situation 2.3 Proper organization of the steps in an appropriate procedure 	<p>Proficiency in Subject-Specific Knowledge</p> <p>Proficiency in subject-specific knowledge presupposes its acquisition, understanding, application and mobilization, and is therefore linked with the evaluation criteria for the competencies.</p>



³ The broad areas of learning are stated exactly as in the course. However, the person who designs the evaluation instrument may choose other broad areas of learning.

Explanation of the Evaluation Content

Evaluation Criteria

The evaluation criteria are stated exactly as in the course.

Not all the evaluation criteria for the course are used in the examination. Nevertheless, the adult learner must receive feedback on all of them during the learning process.

The evaluation criteria used in the examination are presented below. They are associated with Competency 1, *Uses strategies to solve situational problems* and Competency 2, *Uses mathematical reasoning*.

Competency 3, *Communicates by using mathematical language*, is not specifically evaluated for the purpose of certification and recognition. However, as it is an essential part of all mathematical activities, this competency has been taken into account in the assessment tools provided to help teachers come to a judgment.

Information Clarifying the Evaluation Criteria

1.1 Indication (oral or written) that the situational problem has been understood

This criterion evaluates the adult learner's ability to identify what is required in accordance with the wording of the problem and to extract relevant information, taking into account the constraints involved in the mathematical processing of the situation.

1.2 Application of strategies and appropriate mathematical knowledge

This criterion evaluates the adult learner's ability to use relevant strategies to select appropriate knowledge in order to solve the problem.

2.1 Correct use of appropriate mathematical concepts and processes

This criterion evaluates the adult learner's ability to properly apply the mathematical knowledge and skills required to solve the problem.

2.2 Proper implementation of mathematical reasoning suited to the situation

This criterion evaluates the adult learner's ability to present a coherent procedure by drawing upon the appropriate knowledge and skills.

2.3 Proper organization of the steps in an appropriate procedure

This criterion evaluates the adult learner's ability to present a structured procedure that complies with the rules and conventions of mathematics. The answer is consistent with the adult learner's procedure and the context of the situational problem.

Proficiency in Subject-Specific Knowledge

Proficiency in subject-specific knowledge is assessed through the evaluation of competencies, using tasks related to the evaluation criteria.

For this course, certain knowledge is explicitly evaluated.

Weighting

The weighting for the evaluation of the competencies is determined in accordance with the *Framework for the Evaluation of Learning* in general education in the youth sector.

Competency 1, *Uses strategies to solve situational problems*: 30%

Competency 2, *Uses mathematical reasoning*: 50%

The weighting corresponding to the knowledge that is explicitly evaluated is 20%.

The weighting of the evaluation criteria appears in the assessment tools provided in the *Correction and Evaluation Guide*. Adult learners must be made aware of the evaluation criteria used to evaluate them and the corresponding weighting of each criterion.

Knowledge

All the categories of knowledge and at least eight of the eleven items of prescribed knowledge are covered in the examination. However, for a given item of prescribed knowledge, it is not necessary to include all of the items listed in the *Restrictions and Clarifications* column of the table of prescribed knowledge for the course.

Subject-Specific Content

Categories of Knowledge	Prescribed Knowledge
Algebraic expressions	<ul style="list-style-type: none"> Solving first-degree inequalities in two variables
Linear programming	<ul style="list-style-type: none"> System of first-degree inequalities in two variables Representing the constraints and the function to be optimized (objective or economic function) Determining and interpreting the vertices and the feasible region (bounded or unbounded) Changing the conditions associated with the situation to provide a more optimal solution
Graph	<ul style="list-style-type: none"> Representing and modelling a situation using a graph Comparing different graphs Finding Euler and Hamiltonian paths and circuits, a critical path, the shortest path, a tree of minimum or maximum values or the chromatic number
Finding measurements	<ul style="list-style-type: none"> Equivalent figures Finding measurements: <ul style="list-style-type: none"> positions angles lengths (segments, chords) areas volumes Relations in triangles: cosine law

Specifications for the Evaluation Instruments

Examination: Number of Parts, Sections, Procedure and Duration

The examination is divided into two sections. These sections are included in a single booklet and must be administered during the same evaluation session.

Duration: 180 minutes

Examination Content

The two sections are:

1. Explicit evaluation of knowledge
In this section, the adult learner must answer application questions.
2. Evaluation of competencies
This section consists of tasks that the adult learner must complete based on realistic situations. An evaluation situation may cover one, two or three integrative processes as long as all three processes are covered in this section of the examination.

Information-Gathering Tools

The Adult's Booklet is the information-gathering tool and consists of the following two sections:

1. Explicit evaluation of knowledge
The adult learner answers short- and long-answer questions.
2. Evaluation of competencies
The adult learner completes problem-solving tasks.

Authorized Materials

- A scientific or graphic display calculator that is not equipped with a computer algebra system
Information about the calculator and its use:
 - The calculator must not be able to perform algebraic calculations, factor algebraic expressions or solve equations.
 - The data and programs stored in the calculator's memory must be erased before and after the examination. Before the day of the examination, the adult learner must have been given the opportunity to learn how to reset the calculator's memory to zero.
- A ruler, set square, compass, protractor and graph paper
- A memory aid
Information about the memory aid:
 - The adult learner may prepare a memory aid consisting of no more than one 8½ x 11 inch sheet of paper, with information on one side only. It may be handwritten or typed (minimum 12-point font; single-spaced) and must be approved by the teacher.
 - Examples prepared by the adult learner and mathematical formulas may be included in the memory aid.

Assessment Tools

For the explicit evaluation of knowledge, examples of correct solutions are provided in the *Correction and Evaluation Guide*.

For the evaluation of competencies 1 and 2, the criterion-referenced rubric (one for each competency) is the assessment tool used by the teacher. In criterion-referenced interpretation, the information gathered is compared with the outcomes expected of the adult learner.⁴ The criterion-referenced rubrics are appended to the *Correction and Evaluation Guide* and include the following rating scale:

- Excellent
- Very good
- Good
- Weak
- Very weak

To help markers use criterion-referenced rubrics, the person who designs the evaluation instrument may provide a tool for analyzing the data (checklist, information-gathering tool) in order to supplement these rubrics.

Pass Mark

The pass mark is 60%.

Retakes

The adult learner must retake the entire examination.

⁴ Québec, Ministère de l'Éducation, *Policy on the Evaluation of Learning* (Québec: Gouvernement du Québec, 2003), 28-29.

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