Information Document

Uniform Examinations

Mathematics

Secondary IV

June 2020 – July 2020 – January 2021

Science Option 565-420
Technical and Scientific Option 564-420
Cultural, Social and Technical Option 563-420
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INTRODUCTION

This document provides information about the uniform examinations for each of the three mathematics options offered in Secondary IV. These examinations will be administered in June 2020, July 2020 and January 2021.

The Ministère de l’Éducation et de l’Enseignement supérieur is responsible for producing uniform examinations for the three examination sessions. Each examination is based on the Framework for the Evaluation of Learning, the Progression of Learning and the Québec Education Program. Information gathered on examinations administered in previous years is also taken into account. In addition, the Ministère encourages the participation of the school system by inviting teachers and education consultants from different schools to contribute to the development and validation of these examinations.

These examinations evaluate the development of the competency *Uses mathematical reasoning*. They focus on the main concepts and processes covered in each of the options that make up the Secondary IV Mathematics program.

Schools must administer each uniform examination in accordance with the official timetable for the examination sessions.
1. STRUCTURE OF THE UNIFORM EXAMINATIONS

Each uniform examination is divided into three parts. The following table gives a breakdown of the types of tasks involved as well as the number of marks allotted.

**Breakdown of the types of tasks and the number of marks allotted in each uniform examination**

<table>
<thead>
<tr>
<th>Examination Part</th>
<th>Type of Task</th>
<th>Number of Tasks</th>
<th>Marks per Task</th>
<th>Total Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part A</td>
<td>Multiple-choice questions</td>
<td>6</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>Part B</td>
<td>Short-answer questions</td>
<td>4</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Part C</td>
<td>Situations involving applications</td>
<td>6</td>
<td>10</td>
<td>60</td>
</tr>
</tbody>
</table>

For the uniform examination in each of the three options, the Ministère provides the following documents:

For the students:
- A Student Booklet containing the 16 questions in the examination.
  In this booklet, students will indicate the reasoning they used for each of the six situations involving applications in Part C. For the July and January sessions, students must also record their answers to the questions in parts A and B in the Student Booklet.
- A scannable answer sheet (for the June examinations only)
  Students will use the front of the sheet to record their answers for the questions in Part A and the back of the sheet to record their answers for the questions in Part B.

For the person in charge of the administration of ministerial examinations:
- Instructions for the Person in Charge of the Administration of Ministerial Examinations in the School.

For teachers:
- Marking Guide

For invigilators:
- Instructions for Invigilators
2. CONTENT OF THE UNIFORM EXAMINATIONS

The questions in Parts A and B of the uniform examinations are intended to evaluate mastery of mathematical concepts and processes.

Part C consists of six situations involving applications, which require the student to explain his or her mathematical reasoning and organize and apply mathematical concepts and processes in a clearly defined context. Because there are different aspects of reasoning, these tasks may involve a variety of different actions (e.g. choosing and using mathematical concepts and processes, justifying, proving, convincing, assessing, taking a position, comparing, deducing, generalizing).

The examinations are developed by taking into account the relative importance of the branches of mathematics in the examination for each option.

The following table presents the distribution of the marks for each branch of mathematics in the examinations for the three options. The interval presented under each percentage weighting indicates the possible differences among the examinations for the same option. These differences stem from the number of marks allotted for the different types of tasks.

Relative importance of each branch of mathematics

<table>
<thead>
<tr>
<th></th>
<th>ARITHMETIC AND ALGEBRA</th>
<th>STATISTICS AND PROBABILITY</th>
<th>GEOMETRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science Option</td>
<td>52%</td>
<td>6%</td>
<td>42%</td>
</tr>
<tr>
<td></td>
<td>From 48% to 54%</td>
<td>From 4% to 8%</td>
<td>From 40% to 44%</td>
</tr>
<tr>
<td>Technical and Scientific Option</td>
<td>40%</td>
<td>24%</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>From 36% to 44%</td>
<td>From 20% to 28%</td>
<td>From 32% to 40%</td>
</tr>
<tr>
<td>Cultural, Social and Technical Option</td>
<td>32%</td>
<td>18%</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>From 28% to 36%</td>
<td>From 14% to 20%</td>
<td>From 44% to 52%</td>
</tr>
</tbody>
</table>

The situations involving applications in Part C were developed by taking into account the requirements associated with the tasks designed to evaluate the different aspects of mathematical reasoning. For the purpose of developing the uniform examinations, these situations have been grouped into two categories.

Category I  Tasks in which students must choose and carry out a set or series of operations to meet the requirements of the task by using the appropriate mathematical concepts and processes as well as appropriate strategies

Category II Tasks in which students must draw on different aspects of reasoning to convince using mathematical arguments, to recognize a model and apply it, to prove a statement or property, to disprove a statement using a counterexample or to formulate a conjecture
The following table presents the breakdown, by category, of the six situations involving applications in Part C of the examinations for the three options.

### Distribution of the situations involving applications in the uniform examinations

<table>
<thead>
<tr>
<th>Category</th>
<th>Science Option</th>
<th>Technical and Scientific Option</th>
<th>Cultural, Social and Technical Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category I</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Category II</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

3. **CONDITIONS FOR ADMINISTERING THE UNIFORM EXAMINATIONS**

It is forbidden to disclose any information about the content of a ministerial examination to anyone who is not directly involved in its administration, or to distribute any examination document, in whole or in part, at any time or by any means whatsoever, including social media.

3.1 **Examination dates**

The uniform examinations will be administered in June 2020, July 2020 and January 2021 in accordance with the official timetable for the examination sessions.

3.2 **Time allotted**

According to the official timetable, three hours are allotted for each examination. According to the *Administrative Guide for the Certification of Studies and Management of Ministerial Examinations* (2015 edition), however, an additional 15 minutes must be allotted for each examination if necessary.

3.3 **Preparation phase**

The week before each uniform examination, the teacher asks the students to prepare a memory aid on one letter-sized sheet of paper (8½ × 11). Both sides of the sheet may be used. This memory aid must be handwritten. Mechanical reproduction of this memory aid is forbidden. The student’s name and the examination code must be indicated on the memory aid.

3.4 **Performance phase**

**Permitted materials**
- Memory aid prepared by the student prior to the examination
- Calculator (see Section 3.5)
- Ruler, set square, compass, protractor, graph paper

**Administration of the uniform examinations**
- The invigilator explains the rules for taking the examination.
- The invigilator asks the students to read the instructions in the Student Booklet.
- Each student works alone.
- After the examination, the invigilator collects the graph paper and the documents distributed to students as well as the memory aids.
In the interests of equity and justice, the examination must be administered under the same conditions to all students across Québec. It is thus forbidden for anyone to help students in any way, for example by clarifying a question or rewording instructions. Examinations in which a school staff member is deemed to have overstepped the boundaries of their role may be declared invalid by the Direction de la sanction des études.

During the examination, students are strictly forbidden to have in their possession any digital device (smartphone, portable media player, smartwatch, etc.) that can be used to communicate, access the Internet, translate texts, or create, save or consult data.

Any student who is caught in possession of unauthorized materials will be expelled from the examination room for cheating and will receive a mark of 0% on the examination. This rule applies even if a student who is found in possession of a digital device is not using the device or has turned it off.

3.5 Rules for using calculators

Calculators with or without a graphic display may be used during the uniform examinations for Secondary IV mathematics.

Calculators with a computer algebra system (CAS) are permitted only if this system is disabled for the entire examination, because this type of software will, for example, allow students to use the calculator to factor an algebraic expression.

Computers, tablets, electronic organizers and calculators with an alphanumeric keyboard (QWERTY or AZERTY) are prohibited.

Students may not share their calculator with other students.

Accessories and peripherals

User guides, memory expansion features or any other calculator accessories or peripherals are not allowed during the examination. Thus, memory expansion chips or cards and data or program libraries are strictly forbidden. Communication between calculators is also not permitted during the examination.

Configuring calculators for the examination

Prior to the examination, students must be duly informed in writing of the rules regarding the use of calculators during a ministerial examination.

The data and programs stored in the calculator’s memory must be erased before the examination. Before the day of the examination, students must have been given the opportunity to learn how to reset their calculator’s memory. In addition, it is forbidden to store programs in the calculator’s memory during the examination.

Using a calculator whose memory contains programs or data will be considered a form of cheating.

1. Additional instructions regarding the use of technological tools during examinations will be provided at a later date by the Direction de la sanction des études.
3.6 Measures adapting the conditions for administering ministerial examinations

Measures that adapt the conditions for administering ministerial examinations may be taken to enable students with specific needs to demonstrate their learning. For further information on the implementation of these measures, please refer to the documents made available to schools by the Direction de la sanction des études.

4. MARKING PROCEDURES FOR THE UNIFORM EXAMINATIONS

4.1 Responsibility for grading the examinations

June examinations
The answers to the questions in Part A, which students must record on the scannable answer sheet, will be graded by the Ministère. School boards and private schools are responsible for grading Parts B and C in accordance with the instructions provided by the Ministère in the Marking Guide.

July and January examinations
School boards and private schools are responsible for grading all three parts of the uniform examinations in accordance with the instructions provided by the Ministère in the Marking Guide.

4.2 Marking tools

In grading the examination papers, teachers must refer to the instructions in the Marking Guide provided by the Ministère.

The situations involving applications in Part C of the examination are graded using the rubric at the end of this document. The five performance levels in this rubric, which are presented as brief descriptions, make it possible to evaluate student work in accordance with the criteria indicated.

The result obtained for the situations involving applications in Part C of the uniform examination is determined using the weighting of the evaluation criteria.

The weighting of the evaluation criteria will vary according to the purpose and requirements of the situation involving applications. Both the Marking Guide and the Student Booklet will show the weighting for each situation involving applications.

Teachers should ensure that they have a common understanding of the requirements of these situations involving applications.
5. STUDENT’S MARK ON THE UNIFORM EXAMINATION

June 2020 examinations

Once educational institutions have finished marking the questions in Part B and the situations involving applications in Part C, the scannable answer sheet must be submitted to the Direction de la sanction des études in accordance with instructions that will be specified at a later date. All calculations for determining the student’s examination result are carried out by the Ministère.

July 2020 and January 2021 examinations

The preliminary result obtained for Part C of the examination consists of the sum of the results obtained for the situations involving applications. This result is expressed as a mark out of 600. The final result for Part C, expressed as a mark out of 60, is calculated by dividing the preliminary result by 10 and rounding it off to the nearest whole number.

The final result for Part C must be added to the results for Parts A and B in order to calculate the total examination mark.

Details on how to submit the results for these examinations will be specified at a later date by the Direction de la sanction des études.

6. STUDENT’S SUBJECT MARK

Calculating the final mark for the competency Uses mathematical reasoning

The mark students obtain on the uniform examination is combined with their moderated school mark for the competency Uses mathematical reasoning. Each of these two marks will count for 50% of their final mark for this competency.

Calculating the subject mark

The subject mark is obtained by combining the results for the competencies Uses mathematical reasoning and Solves a situational problem according to the weighting established by the Ministère. This weighting can be found in the Framework for the Evaluation of Learning.

Additional information in this regard is available in the Processing of results section on the website of the Ministère (www.education.gouv.qc.ca).
### RUBRIC FOR THE SITUATIONS INVOLVING APPLICATIONS

<table>
<thead>
<tr>
<th>EVALUATION CRITERIA</th>
<th>LEVEL A</th>
<th>LEVEL B</th>
<th>LEVEL C</th>
<th>LEVEL D</th>
<th>LEVEL E</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cr. 3</strong></td>
<td>The student . . .</td>
<td>The student . . .</td>
<td>The student . . .</td>
<td>The student . . .</td>
<td>The student . . .</td>
</tr>
<tr>
<td><strong>Proper implementation of mathematical reasoning suited to the situation</strong></td>
<td>- chooses appropriate concepts and processes and uses actions, strategies, hypotheses, assumptions, etc. that make it possible to meet the requirements of the situation</td>
<td>- chooses appropriate concepts and processes and uses actions, strategies, hypotheses, assumptions, etc. that make it possible to meet most of the requirements of the situation</td>
<td>- chooses appropriate concepts and processes and uses actions, strategies, hypotheses, assumptions, etc. that make it possible to meet some of the requirements of the situation</td>
<td>- chooses appropriate concepts and processes and uses actions, strategies, hypotheses, assumptions, etc. that make it possible to partially meet one of the requirements of the situation</td>
<td>- chooses concepts and processes and uses actions, strategies, hypotheses, assumptions, etc. that make it possible to meet all of the requirements of the situation</td>
</tr>
<tr>
<td><strong>Cr. 2</strong></td>
<td>Applies the required concepts and processes appropriately to meet the requirements of the situation</td>
<td>Applies the required concepts and processes appropriately to:</td>
<td>Applies some of the required concepts and processes appropriately to:</td>
<td>Applies few of the required concepts and processes appropriately to meet the requirements of the situation, and may or may not make minor mistakes</td>
<td>Does not apply any of the required concepts and processes appropriately to meet the requirements of the situation</td>
</tr>
<tr>
<td><strong>Correct use of appropriate mathematical concepts and processes</strong></td>
<td>- applies the required concepts and processes appropriately to:</td>
<td>meet the requirements of the situation, but makes one or more minor mistakes OR</td>
<td>meet most of the requirements of the situation, and may or may not make minor mistakes</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cr. 4</strong></td>
<td>Shows clear and organized work that is in keeping with the rules and conventions of mathematical language</td>
<td>Shows clear work, although some elements are implicit, and makes few or no mistakes regarding the rules and conventions of mathematical language</td>
<td>Shows work that lacks clarity because it is incomplete or includes several mistakes regarding the rules and conventions of mathematical language</td>
<td>Shows work that consists of confusing or isolated elements that may include mistakes regarding the rules and conventions of mathematical language</td>
<td>Shows little work</td>
</tr>
<tr>
<td><strong>Proper organization of the steps in an appropriate procedure</strong></td>
<td>Uses appropriate arguments to justify or support the statements, conclusions or results that need to be justified or supported</td>
<td>Uses appropriate arguments to justify or support most of the statements, conclusions or results that need to be justified or supported</td>
<td>Uses appropriate arguments to justify or support some of the statements, conclusions or results that need to be justified or supported</td>
<td>Uses appropriate arguments to justify or support few of the statements, conclusions or results that need to be justified or supported</td>
<td></td>
</tr>
<tr>
<td><strong>Cr. 5</strong></td>
<td>Formulates one or more appropriate conjectures that account for every aspect of the situation</td>
<td>Formulates one or more partial conjectures that account for most of the aspects of the situation</td>
<td>Formulates one or more partially appropriate conjectures that account for certain aspects of the situation</td>
<td>Formulates one or more largely inappropriate conjectures that account for few aspects of the situation</td>
<td>Formulates one or more inappropriate conjectures</td>
</tr>
<tr>
<td><strong>Correct justification of the steps in an appropriate procedure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cr. 1</strong></td>
<td>Formulates one or more appropriate conjectures that account for every aspect of the situation</td>
<td>Formulates one or more appropriate conjectures that account for most of the aspects of the situation</td>
<td>Formulates one or more partially appropriate conjectures that account for certain aspects of the situation</td>
<td>Formulates one or more largely inappropriate conjectures that account for few aspects of the situation</td>
<td></td>
</tr>
<tr>
<td><strong>Formulation of a conjecture suited to the situation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* 
- To apply a concept or process appropriately means that the student must apply it without making a conceptual or procedural error.
- The student may fail to apply a concept or process that is required to carry out all the steps in a line of reasoning and that was not part of the learning prescribed for an academic level lower than the level for which the examination is designed. In such cases, the student is considered to have made a conceptual or procedural error.
- The student is considered to have made a minor mistake if there is an error in the application of a concept or process that was part of the learning prescribed for an academic level lower than the level for which the examination is designed.

** 
- The student may be required to make conjectures (hypotheses, assumptions, etc.) at different stages in their line of mathematical reasoning. Criterion 3 will be used to evaluate these conjectures, but the written work involved in making these conjectures may not always be fully shown.