Commission scolaire English-Montréal
English Montreal School Board

Mathematics — 565-426

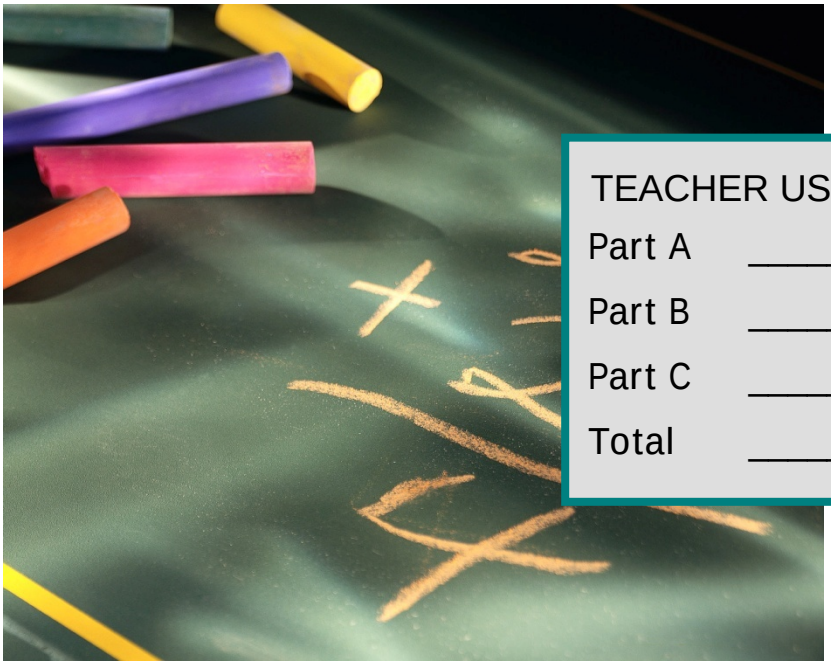
Secondary IV

May 2015

May Practice Exam

Competency Two
Uses Mathematical Reasoning

Science Option



TEACHER USE ONLY		
Part A	_____	/24
Part B	_____	/16
Part C	_____	/60
Total	_____	/100

Student Booklet

Name: _____

Group: _____

Time: 3 hours

PART A

1. [A] [B] [C] [D]

2. [A] [B] [C] [D]

3. [A] [B] [C] [D]

4. [A] [B] [C] [D]

5. [A] [B] [C] [D]

6. [A] [B] [C] [D]

PART B

7. The distance between the Frisbee and the ground decreased for _____ seconds. | 4 | 0 |

8. The length of line segment EF is _____ cm. | 4 | 0 |

9. The diameter of the cylinder is _____ cm. | 4 | 0 |

10. The solutions of the inequality are _____

_____. | 4 | 2 | 0 |

PART C

This part of the examination consists of Questions 11 to 16.

Each question in this part of the examination is worth 10 marks.

For each question, you must show all your work to justify your answer.

Your work must be organized and clearly presented and cannot simply involve listing the calculator applications used to obtain results or information.

All the work you show in this booklet for Questions 11 to 16 will be considered.

You will be given a mark of 0 if you do not show your work or if your work does not justify your answer.

The evaluation criteria for the competency required to answer the questions in this part of the examination are the following:

Criterion 1 Formulation of a conjecture suited to the situation

Criterion 2 Correct use of appropriate mathematical concepts and processes

Criterion 3 Proper implementation of mathematical reasoning suited to the situation

Criterion 4 Proper organization of the steps in an appropriate procedure

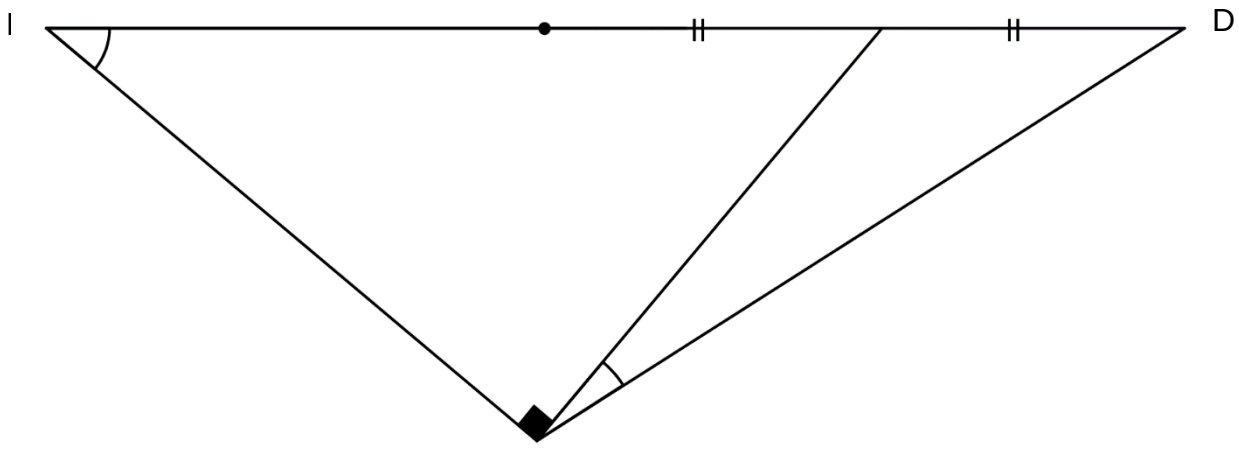
Criterion 5 Correct justification of the steps in an appropriate procedure

11. ANGLE EFD

Line segment EF was drawn to form two triangles inside triangle BFD as represented below.

In addition:

- Point C is on line segment BD



To the nearest degree, what is the measure of angle EFD?

To the nearest degree, the measure of angle EFD is _____ ^{o}.

Uses mathematical reasoning							
		Observable indicators correspond to level					
Evaluation Criteria	LEVEL	A	B	C	D	E	0
	Cr3	40	32	24	16	8	0
	Cr2	40	32	24	16	8	
	Cr4 Cr5	20	16	12	8	4	

12. TWO PARABOLAS

In the Cartesian plane, functions *f* and *g* are represented by two parabolas.

The following information is given about both functions:

- The coordinates of the vertex of function *f* are (30, 12.5)
- $f(40) = g(40) = 0$
- functions *f* and *g* have the same y-intercept
- $g(10) = 0$

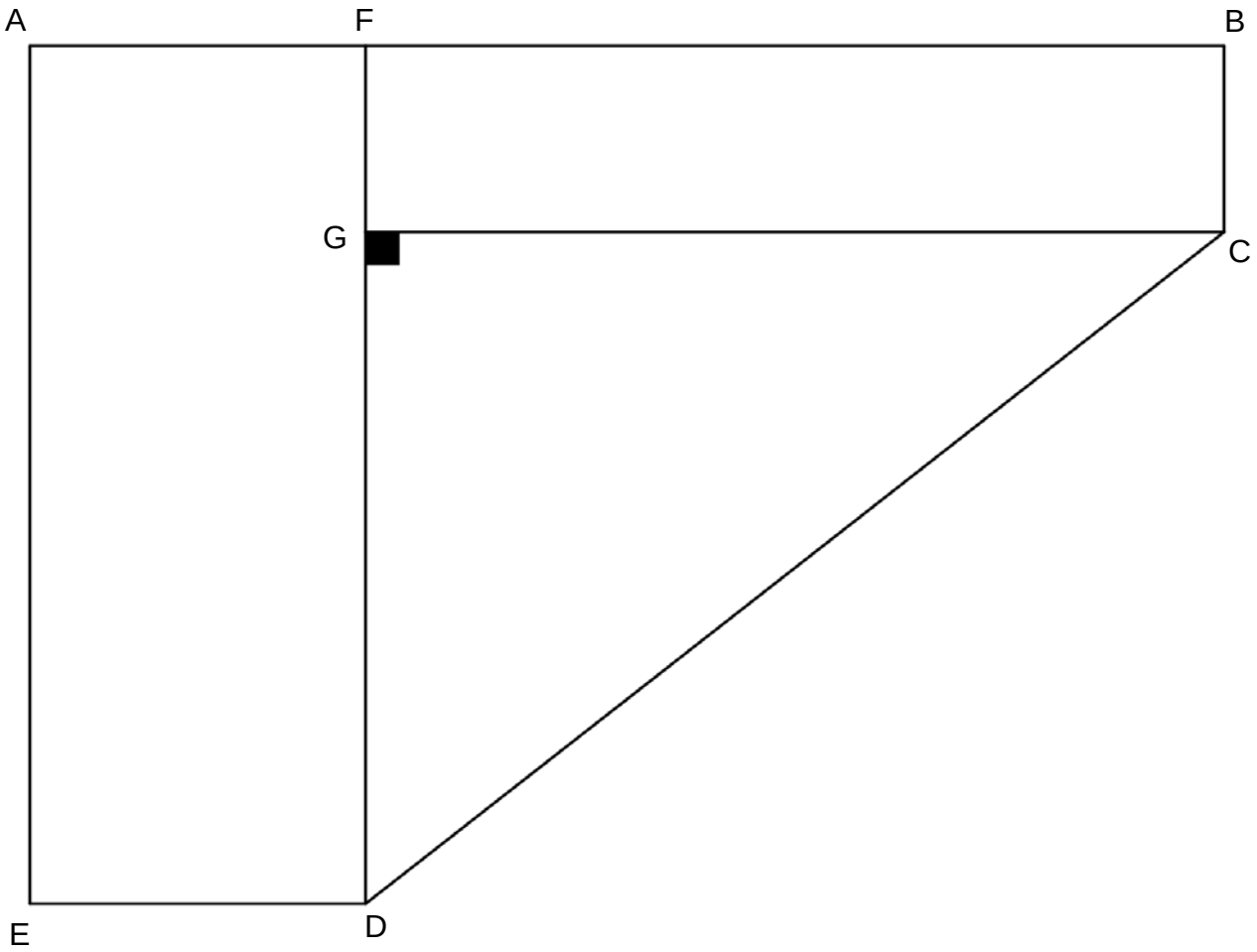
To the nearest tenth of a unit, what is the distance between the vertices of the parabolas?

To the nearest tenth of a unit, the distance between the vertices of the parabolas is _____ units.

Uses mathematical reasoning							
		Observable indicators correspond to level					
Evaluation Criteria	LEVEL	A	B	C	D	E	0
	Cr3	40	32	24	16	8	0
	Cr2	40	32	24	16	8	
	Cr4 Cr5	20	16	12	8	4	

13. A PENTAGON

Pentagon ABCDE represented below was divided into two rectangles and right triangle CDG.



In the resulting figure:

- triangle CDG and rectangle AFDE are equivalent
- the area of rectangle AFDE is represented by the polynomial $6x^2 + 41x + 30$
- m $\overline{GD}$ = $(5x + 3)$ units
- m $\overline{GC}$ = $(8x - 1)$ units

What is the numerical value of the area of rectangle FBCG?

The numerical value of the area of rectangle FBCG is _____ u^2.

Uses mathematical reasoning							
		Observable indicators correspond to level					
Evaluation Criteria	LEVEL	A	B	C	D	E	0
	Cr3	40	32	24	16	8	0
	Cr2	40	32	24	16	8	
	Cr4 Cr5	20	16	12	8	4	

14. THE JEWELLERY PACKAGES

A jewellery maker produces one type of bracelet and one type of necklace and ships them to stores in three different packages.

The table below provides information on these packages.

Package	Number of bracelets	Number of necklaces	Total mass of the jewelry in the package (g)
A	20	25	4500
B	64	48	9600
C	32	96	?

The jewellery maker was told that she could determine the shipping cost by using the following function:

$$f(x) = -\frac{3}{2}\left[-\frac{x}{500}\right] + 20$$

where x : mass of the package in grams,
$f(x)$: the shipping cost, in dollars.

If the jewellery maker combined all three packages into one package, would the shipping cost be less than, equal to, or greater than the sum of the shipping cost of the three packages separately?

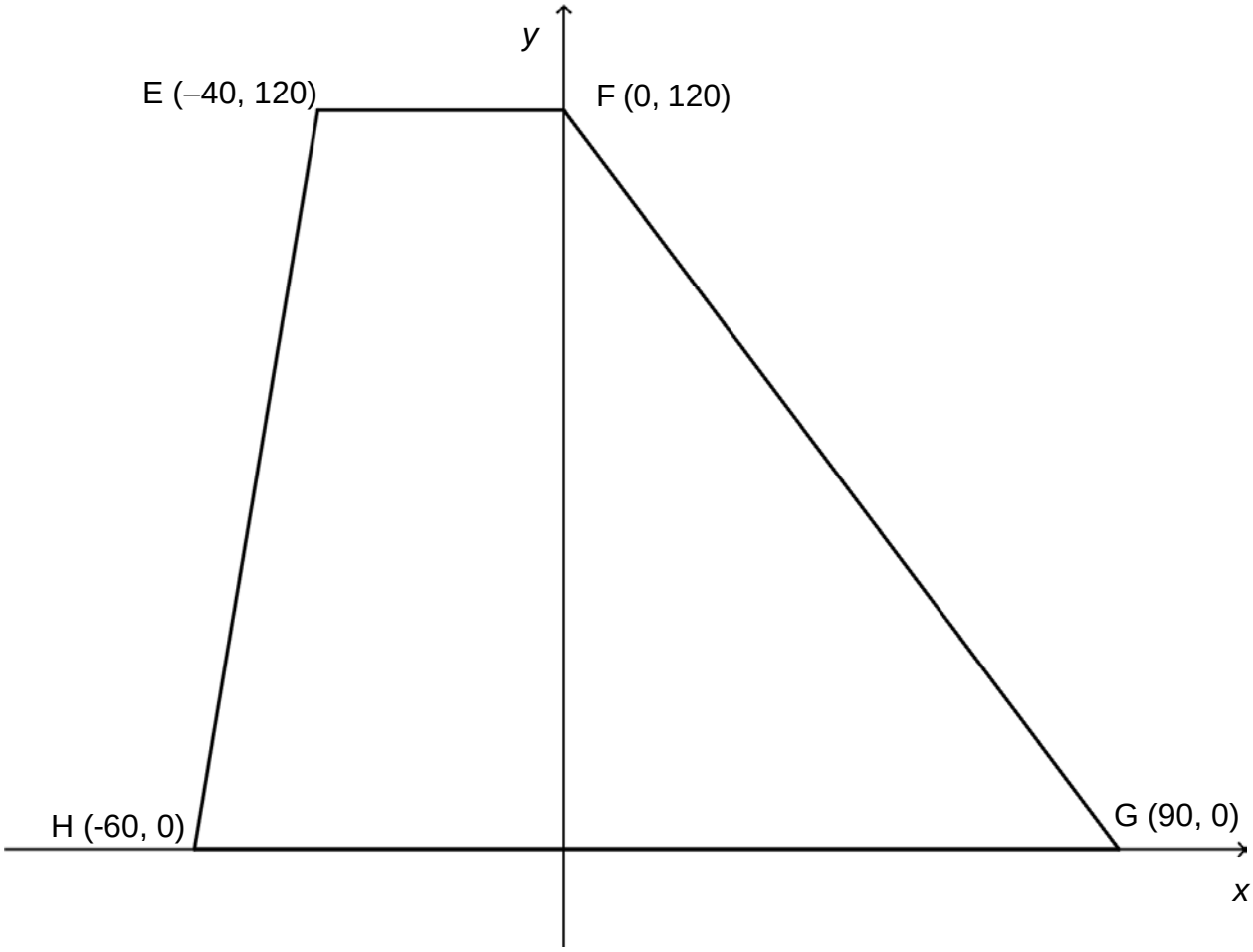
If the jewellery maker combined all three packages into one package, the shipping cost would be _____the sum of the shipping cost of the three packages separately.

Uses mathematical reasoning							
		Observable indicators correspond to level					
Evaluation Criteria	LEVEL	A	B	C	D	E	0
	Cr3	40	32	24	16	8	0
	Cr2	40	32	24	16	8	
	Cr4 Cr5	20	16	12	8	4	

15. THE GARDEN

Tina has a large garden for flowers and vegetables in her backyard.

In the Cartesian plane represented below, quadrilateral EFGH represents her garden. The scale of this graph is in decimetres.



This year, Tina has decided to plant vegetables only in the portion of her garden that belongs to the half-plane described by the inequality $\frac{x}{-15}+\frac{y}{30}\geq 1$.

What is the area of the portion of the garden where Tina will plant her vegetables this year?

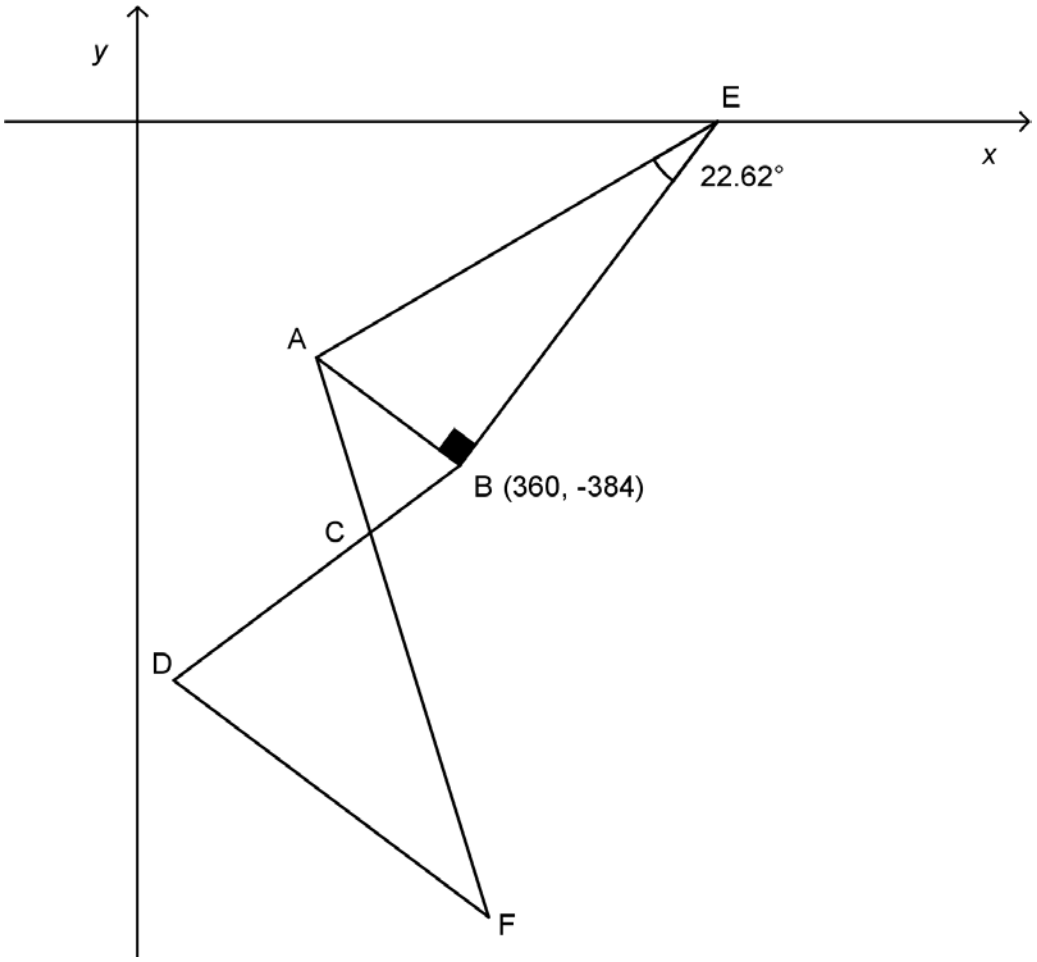
The area of the garden where Tina will plant vegetables this year is _____dm^2.

Uses mathematical reasoning							
		Observable indicators correspond to level					
Evaluation Criteria	LEVEL	A	B	C	D	E	0
	Cr3	40	32	24	16	8	0
	Cr2	40	32	24	16	8	
	Cr4 Cr5	20	16	12	8	4	

16. LINE SEGMENT DF

In the Cartesian plane below:

- The equation of line segment AB is $y = -\frac{3}{4}x - 114$
- The equation of line segment DF is $y = -\frac{3}{4}x - 594$
- $\overline{AB} \perp \overline{BE}$
- Point E is located on the *x*- axis
- m $\angle AEB$ = 22.62°
- m $\overline{BC}$ = 125 units
- m $\overline{CD}$ = 275 units



Show that m $\overline{DF}$ = 440 units.

Uses mathematical reasoning							
		Observable indicators correspond to level					
Evaluation Criteria	LEVEL	A	B	C	D	E	0
	Cr3	40	32	24	16	8	0
	Cr2 Cr5	40	32	24	16	8	
	Cr4	20	16	12	8	4