higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

GENERAL EDUCATION AND TRAINING CERTIFICATE

NQF LEVEL 1

ABET LEVEL 4 SITE-BASED ASSESSMENT

LEARNING AREA	**:**	**MATHEMATICS AND MATHEMATICAL SCIENCES**
CODE	**:**	**MMSC4**
TASK	**:**	**PROJECT**
DURATION	**:**	**3 WEEKS**
MARKS	**:**	**50**

This assessment task consists of 6 pages and 3 ANNEXURES.

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INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions in ANSWER BOOK.

2. Read ALL the questions carefully.

3. Calculators may be used.

4. Clearly show calculations, diagrams, graphs, et cetera which you have used in determining the answers,

5. Number the answers according to the numbering system used in this question paper.

6. This project must be completed over a period of 3 weeks.

7. The project can be done in groups of not more than 6 members. Each group member must submit their individual work even though they worked as a team.

8. Read the instructions and questions carefully, and do thorough planning before you start with the project.

9. You will need the following resources for this project
    - Pencil
    - Ruler
    - A4 paper or cardboard
    - Calculator

ACTIVITY 1

In this activity, you will be using line graphs to construct a shape.
Complete the tables below using the given equations on Annexure A.
Use the completed tables in Annexure A to sketch the graphs on Annexure B.
Note:

- Do not go beyond the restrictions for each graph.
- Label each graph according to the numbering of the equations.
- Activity 1 will be marked using the rubric.

A. $x = 1$ where $0 \leq y \leq 6$

x	1						1
y	0	1	2	3	4	5	6

B. $x = 9$; where $0 \leq y \leq 6$

x							
y	0	1	2	3	4	5	6

C. $y = 0$; where $1 \leq x \leq 9$

x	1	2	3	4	5	6	7	8	9
y	0								

D. $y = 6$; where $0 \leq x \leq 10$

x	1	2	3	4	5	6	7	8	9	10
y										

E. $y = \frac{1}{2}x + 6$ where $0 \leq x \leq 5$

x	0	1	2	3	4	5
y						

F. $y = -\frac{1}{2}x + 11$; where $5 \leq x \leq 10$

x	5	6	7	8	9	10
y						

G. $x = 4$; where $0 \leq y \leq 4$

x					
y	0	1	2	3	4

H. $x = 6$; where $0 \leq y \leq 4$

x					
y	0	1	2	3	4

I. $y = 4$; where $4 \leq x \leq 6$

x	4	5	6
y			

J. $x = 2$; where $3 \leq y \leq 5$

x			
y	3	4	5

K. $x = 3$; where $3 \leq y \leq 5$

x			
y	3	4	5

L. $y = 3$; where $2 \leq x \leq 3$

x	2	3
y		

M. $y = 5$; where $2 \leq x \leq 3$

x	2	3
y		

RUBRIC

Name and Surname:

Centre Name:

Criteria	Level					Marks
	1	2	3	4	5	
Coordinate tables	At least one table completed correctly.	At least four tables completed correctly	At least eight tables completed correctly	At least 12 tables completed correctly	All tables completed correctly	$\overline{5}$
Plotting of graphs	At least one graph plotted correctly	At least four graphs plotted correctly	At least eight graphs plotted correctly	At least 12 graphs plotted correctly	All graphs are plotted correctly	$2 \times \_\_\_\_$ $\overline{10}$
Presentation and general impression	Untidy work little effort taken with presentation.	Work in organised fashion, some effort taken	Partially presented	Work well presented, neat and complete	Excellent presentation	$\overline{5}$
Labelling of graphs	At least one graph is labelled.	At least four graphs are labelled	At least 8 graphs are labelled	At least 12 graphs are labelled	All graphs are labelled	$\overline{5}$
				TOTAL		$\overline{25}$

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ACTIVITY 2

Attached is an isometric dot paper (ANNEXURE C) in which you will draw patterns of triangles. The first and second patterns are already drawn.

2.1 Draw the third and fourth patterns (4)

2.2 Given the following table representing pattern number (n) and number of small triangles (T_n):

Pattern Number (n)	1	2	3	4	5	6	25
Number of small triangles (T_n)	1	4	9				

2.2.1 Copy and complete the table above. (2)

2.2.2 (Choose one answer from the possible answers given and write the letter next to the question number. e.g 2.4.6 D)
What type of a number system is formed by the number of small triangles (T_n).

A. Prime numbers
B. Square numbers
C. Odd numbers
D. Even numbers (1)

2.2.3 Determine the general rule T_n to work out how many small triangles are there in any pattern (n). (2)

2.2.4 What is the pattern number if the triangle has 1296 triangles? (2)

2.2.5 Describe, in words, the relationship between the pattern number (n) and the number of small triangles T_n in the sequence. (1)

2.3 Given below is a representation of the relationship between the pattern number (n) and the number of dots used (d):

Pattern Number (n)	1	2		4	25
Number of dots (d)	3	6	10		

2.3.1 If the general term for number of dots is $d = \frac{n^2+3n+2}{2}$, copy and complete the table. (3)

2.3.2 How many dots of the isometric dot paper will be needed for the 15^{th} pattern? (2)

2.3.3 Is the number of dots (d) a dependent or independent variable? (1)

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2.3.4 Choose one answer from the possible answers given and write the letter next to the question number, e.g 2.4.6 D
What type of triangle are the drawn triangles?

E. Scalene
F. Right angled
G. Equilateral
H. Isosceles (1)

2.3.5 If you have 261 dots, will they create a complete triangle? Motivate your answer by showing calculations. (3)

2.4 Hexagon P is represented on ANNEXURE C. Use the centre dot as a reference point and answer the following questions:

2.4.1 Give the name of the transformation that transformed P to Q. (1)

2.4.2 Hence, describe how P is translated to create Q. (1)

2.4.3 By what factor was hexagon Q enlarged to form hexagon R? (1)
[25]

[50]

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ANNEXURE A

Name and Surname:_____		

Centre Name: _____		

A. $x = 1$ where $0 \leq y \leq 6$

x	1						1
y	0	1	2	3	4	5	6

B. $x = 9$; where $0 \leq y \leq 6$

x							
y	0	1	2	3	4	5	6

C. $y = 0$; where $1 \leq x \leq 9$

x	1	2	3	4	5	6	7	8	9
y	0								

D. $y = 6$; where $0 \leq x \leq 10$

x	1	2	3	4	5	6	7	8	9
y									

E. $y = \frac{1}{2}x + 6$ where $0 \leq x \leq 5$

x	0	1	2	3	4	5
y						

F. $y = -\frac{1}{2}x + 11$; where $5 \leq x \leq 10$

x	5	6	7	8	9	10
y						

G. $x = 4$; where $0 \leq y \leq 4$

x					
y	0	1	2	3	4

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ANNEXURE A (Continued)

Name and Surname:_____

Centre Name: _____

H. $x = 6; \text{where } 0 \leq y \leq 4$

x					
y	0	1	2	3	4

I. $y = 4; \text{where } 4 \leq x \leq 6$

x	4	5	6
y			

J. $x = 2; \text{where } 3 \leq \text{y} \leq 5$

x			
y	3	4	5

K. $x = 3; \text{where } 3 \leq \text{y} \leq 5$

x			
y	3	4	5

L. $y = 3; \text{where } 2 \leq x \leq 3$

x	2	3
y		

M. $y = 5; \text{where } 2 \leq x \leq 3$

x	2	3
y		

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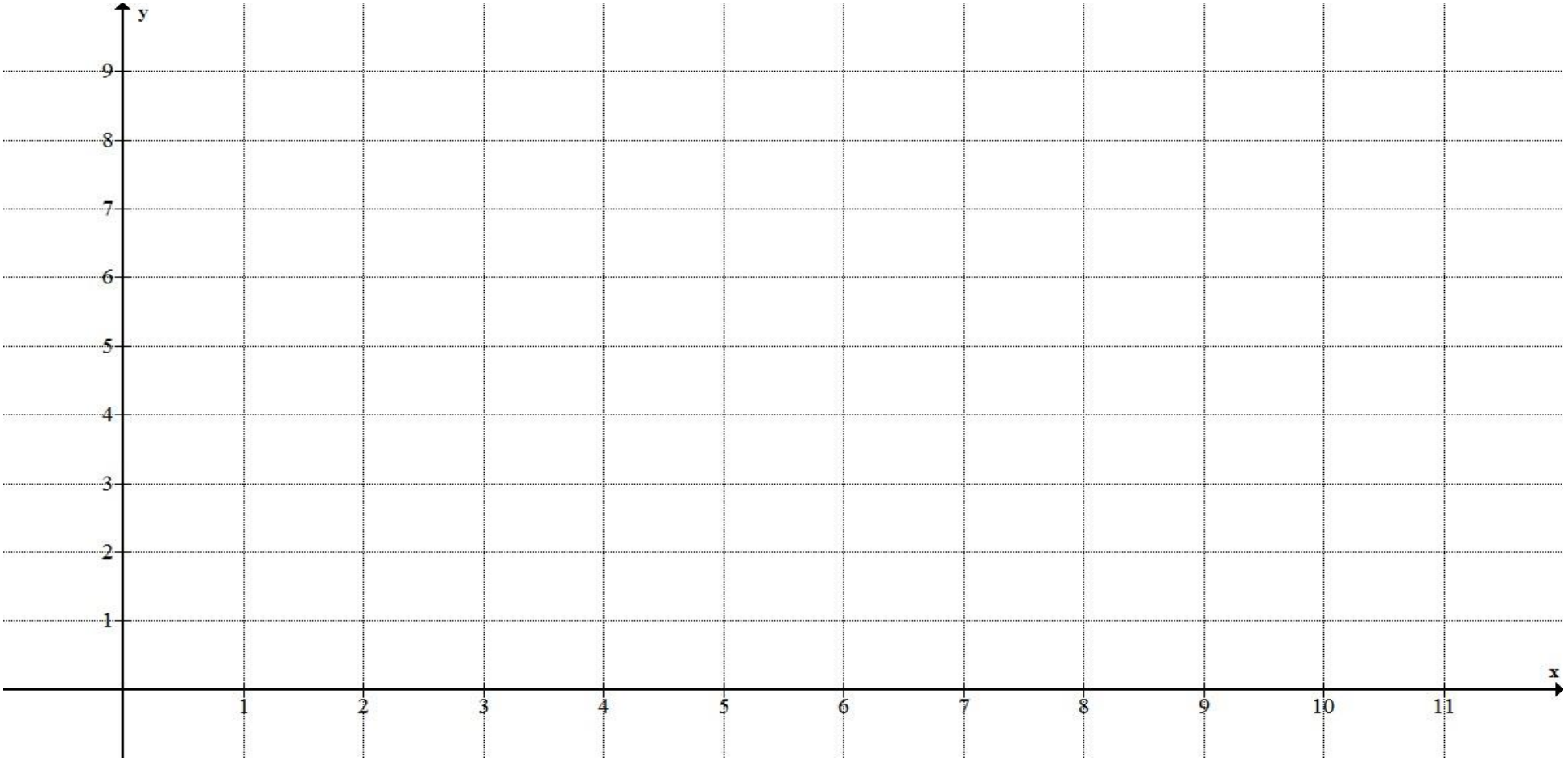
ANNEXURE B

Name and Surname:

Centre Name:



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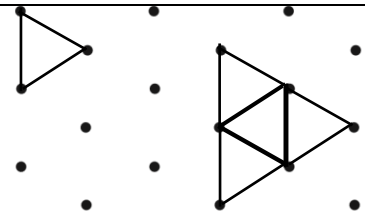
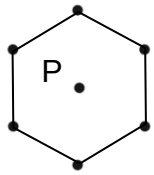
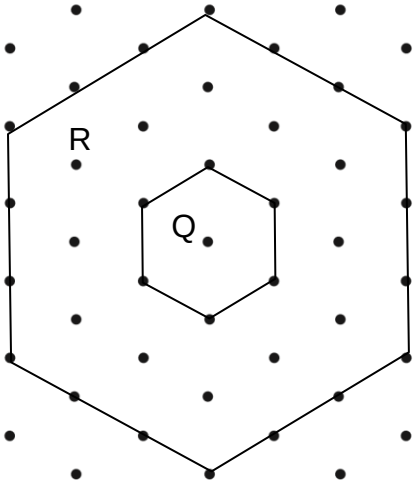
ANNEXURE C : Isometric Dot Paper

Name and Surname:
Centre Name:







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