Mathematics
Paper 1
Sample paper 2021
2 hours

LOGO

UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Lower Secondary Education

Mathematics

Paper 1

2 hours

CANDIDATE NAME: _____

CANDIDATE NUMBER: _____

CENTRE NUMBER: _____

THIS PAGE IS FOR EXAMINER'S USE ONLY

Do not write in the boxes on this page. The examiner will use them to keep a record of your marks.

SECTION A

Qn	1	2	3	4	5	6	7	8	9	10	Total
Marks scored											

SECTION B

Qn	11	12	13	14							Total
Marks scored											

INSTRUCTIONS

1. Answer all the questions in both sections.
2. Each question in section A carries 4 marks and each question in section B carries 15 marks.
3. Pay attention to the number of marks available for each question.
4. Show all the working and explanation on the answer sheets provided.

Section A (40 MARKS)

1. Draw an abacus and illustrate this expression $4 \times 8^4 + 2\times 8^2 + 4\times 8^0$ on it.

2. In a Geography lesson, Alex learnt about the following places; Mount Longonot, Mount Elgon, Mount Meru, Mount Kilimanjaro, Mount Rwenzori, Kenya, Tanzania and Uganda.

(a) Draw an arrow diagram to show the relation amongst the places listed.

(b) What is the domain and the range from your relation?

3. Simplify $(5-\sqrt{3})(2+\sqrt{3})$. Give your answer in the form $a+b\sqrt{3}$. Identify the value of a and b.

4. A number which is a multiple of 3 is chosen at random from a set of even numbers between 1 and 20. What is the probability of choosing the number?

5. There are two screws; one at the top of the sign post and the other in the middle. One of these two screws securing the STOP road sign post dropped. The sign post then hang upside down as shown in figure. If the remaining screw is the center of rotation,

(i) Which of the two screws would be the centre of rotation?

(ii) Through what angle would the sign post be moved back to its original position?

6. A flower garden in the form of a square has an area of X^2-6x + 9.

   (a) Work out the length of the side.

   (b) If the flower garden has an area of 100 square metres, workout the value of x.

7. Mariam and Peter take 30 and 40 minutes respectively to run round a circular track. If they started their race at 8:00 am from the same starting point;

(a) What is the earliest time they will be at the starting point together?

(b) After how many hours will they be at the starting point together?

8. (a) At the class assembly, Senior 3 learners form a pattern of 4 rows by10 columns.

(a) Determine the number of learners at the class assembly?

(b) From your answer obtained in (a) illustrate with the aid of a diagram, how many possible rectangular patterns you can make?

9. A translation described by vector ***T*** transforms a point A (3, -2) to A' (5, 2).

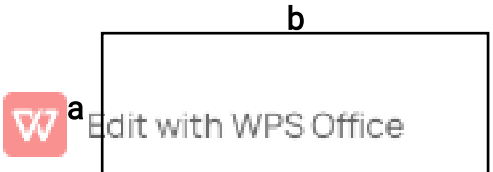
   (a) What is the vector translation T?

   (b) Use the translation obtained in (a) to work out the coordinates of the image of point B (2, 4).

10. A camera price that long stayed in a supermarket was reduced by 20%, then by 25% and finally by 40%. If the final price was 216,000, what was the original price?

Section B (60 Marks)

11. A garden of beans is rectangular in shape with length as ***b*** metres and width ***a*** metres as



shown in the figure.

(a) Explain how the area of the triangle can be obtained from the rectangular garden if it is divided into two triangles?

(b) Write an expression in terms of the area (A),***a*** and ***b*** for the area of the triangular portion of the garden.

(c) Copy and draw the rectangle and shade the portion that is represented by the expression you obtained in (b).

(d) The area of the portion you shaded in (c) is 464.52m^2,the length is 15.24m. What is the dimension of the width?

12. Two learners were given a task of plotting the following points on the grid. A(0, 4) B (2, 2), C (4, 2), D (2, 0), E (4, -2), F (0, -1), G (-4, -2), H (-2, 0), I (-4, 2) and J (- 2, 2). Before they plotted the points, Jane told Musa that when plotting, for point A you move 4units to the right of the origin and no movement along the y-axis from the origin. For point C you move 2 units to the right of the origin and 4 units parallel to the y-axis in the positive direction. Musa said no for point A there is no movement along the x-axis, you only move 4 units along the y–axis. While for point C you move 4 units from the origin on the x-axis, then two units parallel to the y–axis.

(a) Comment with reasons on Jane's explanation of plotting the points.

(b) Using Musa's explanation, plot the coordinates.

(c) Join the points to form a polygon. State the equation of the line of symmetry.

13. Below is triangle ABC whose interior angles are 30^0, 90^0 and 60^0 respectively. Triangle DEC is congruent to triangle ABC. Point B, C and D lie on the same line.

(a) Which point would help you be able to map triangle ABC onto triangle DEC?

(b) What special geometrical name is given to that point identified in (a)

(c) How many degrees does triangle ABC have to undergo in order to fit onto triangle DEC?

(d) Describe the transformation that would completely map triangle ABC onto triangle DEC.

(e) What geometrical name would you use to describe line BC in relation to triangles ABC and A^1BC?

(f) Describe fully the transformation that maps ABC onto A^1BC.

14. A regular pyramid with a square base, has a circle inscribed on the base of the pyramid. The edges of the square base of the pyramid are tangent to the circle. If the radius of the circle is 5cm, and each of the slant edges of the pyramid is 13cm;

(a) Sketch a diagram represented by the information provided.

(b) Work out the height of the pyramid.

(c) Find the volume of the pyramid.

(d) Find the area of the part not covered by the circle on the base of the pyramid.

END

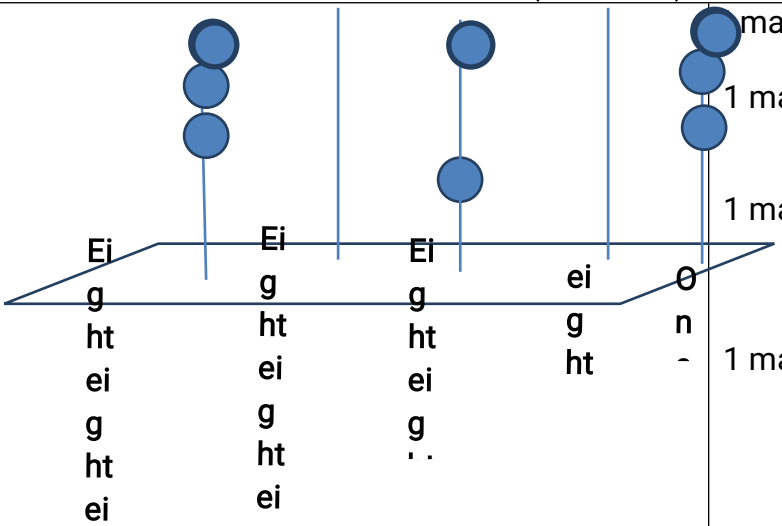
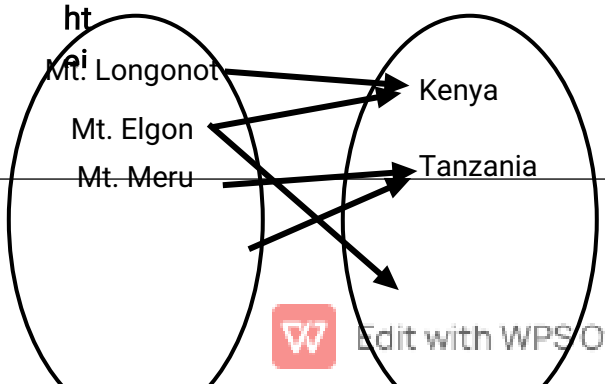
SAMPLE EXAMINATION PAPER

UGANDA LOWER SECONDARY EDUCATION EXAMINATION

PAPER ONE

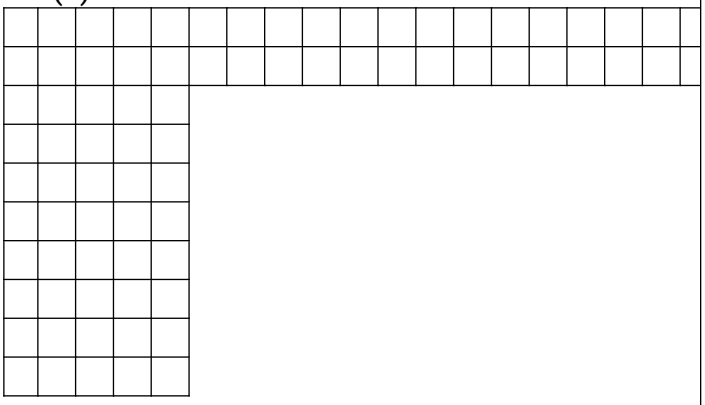
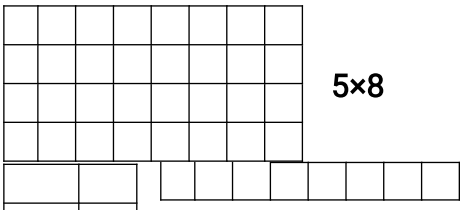
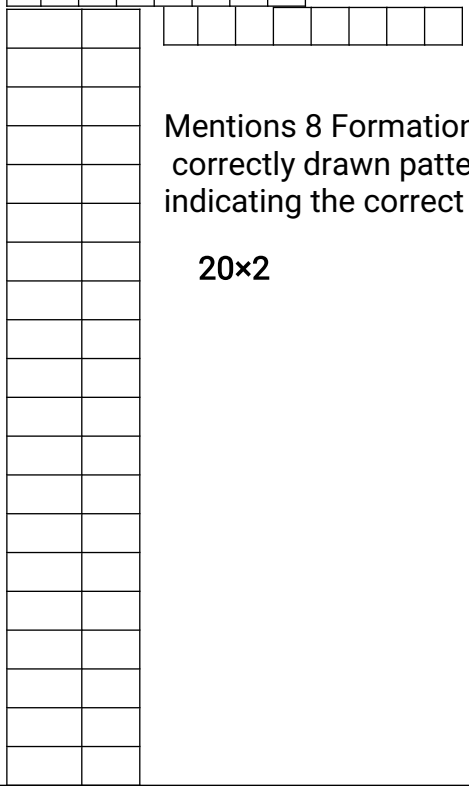
MARKING GUIDE

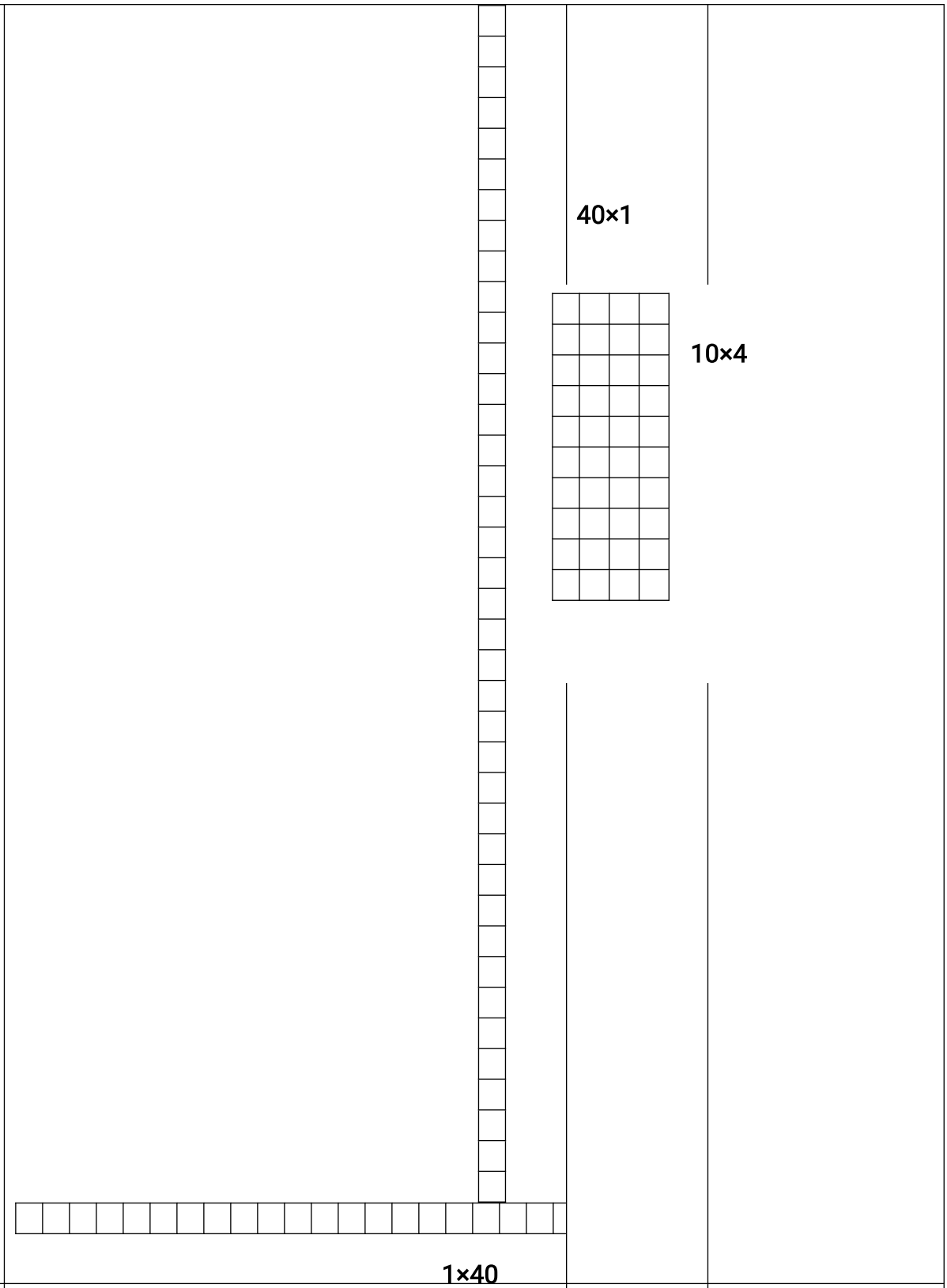
MATHEMATICS

QN	SOLUTION	SCORE	COMMENT
	SECTION A (40 Marks)		
1		mark 1 mark 1 mark 1 mark	Drawing abacus Number of balls on the spikes. Identifying the place values on each spike. Writing the correct number 40204 eight
TOTAL		04	
2		1 mark 1 mark	For correctly mapping. For identifying that Mt Elgon belongs

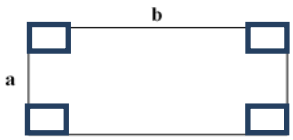
	Mt. Kilimanjaro Mt. Rwenzori → Uganda Domain is the name of mountains Range is the name countries (Observe learner's arrows. Some may name countries as domain while name of mountains as the range (NOTE: they may change the direction of arrows)	 1 mark 1 mark	to two countries. States the correct domain. States the correct range. Score as above.
TOTAL		04	
3	$(5-\sqrt{3})(2+\sqrt{3})$ $= 5(2+\sqrt{3})- \sqrt{3}(2+\sqrt{3})$ $=10 + 5\sqrt{3} - 2\sqrt{3} - \sqrt{9}$ $=10-3+3\sqrt{3}$ $=7+3\sqrt{3}$ a= 7 and b=3	1 mark 1 mark 1 mark 1 mark	For correct expansions. For collecting like terms. For simplifying. For extracting the correct values.
TOTAL		04	
4	A set of Even nos S={2,4,6,8,10,12,14,16,18} n(S)= 9 A set of Multiples of three M={6,12,18} Probability= $\frac{n(M)}{n(S)}$ Probability= $\frac{3}{9}$ Probability= $\frac{1}{3}$	1 mark 1 mark 1 mark 1 mark	For listing the correct even numbers. For listing the set of multiples of 3 for obtaining correct number of elements in both sets. For obtaining correct probability. It may be simplified. Award accordingly.
TOTAL		04	
5	(i) The middle screw is the centre of rotation	1 Mark	For explaining that the top screw dropped and the

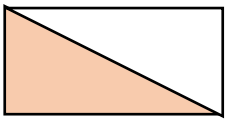
	(ii) 180^0 is the angle of rotation through anticlockwise or clockwise turn	1 Mark 2 Marks	middle remained thus turning the signpost upside down. The measure of the angle of rotation. For stating the directions correctly.
TOTAL		04	
6 (a) (b)	x^2-6x+9 x^2-3x-3x+9 x(x-3)-3(x-3) (x-3) (x-3) Length=(x-3) metres $(x-3)^2=100$ $((\sqrt{(x-3)2}=\sqrt{100}$ x-3=±10 A positive value of $\sqrt{100}$ is used since measurement of length is of a positive magnitude x-3=10 x=10+3 x=13	1 mark 1 mark 1 mark 1 mark	For factorisation. For correct expression of length. Equation to the area given. Explaining why use a positive value of 10
TOTAL		04	
7	<table><tr><td></td><td>Start Time</td><td></td><td></td><td></td></tr><tr><td>Mariam</td><td>8.00am</td><td>8.30am</td><td>9.00am</td><td>9.30am</td></tr><tr><td>Peter</td><td>8.00am</td><td>8.40am</td><td>9.20am</td><td>10.00am</td></tr></table> (a) 10.00am Start time was 8.00am, while they met again at 10.00am (b) So, they met again after= (10.00-8.00)	1 mark 1 mark 1 mark 1 mark	Mariam's consistent time of equal intervals of 30 minutes. Peter's consistent time of equal intervals of 40 minutes. Award accordingly

	am =2 hours Learners may use the clock, look out of the pattern being used to obtain the answer. Others may work it out using the concept of LCM		
TOT		04	
8	(a) Number of learners are 4×10= 40  2×20  5×8  Mentions 8 Formations. correctly drawn patterns indicating the correct orders 20×2	1 Mark 1 mark 1 mark 1 mark 8×5	Learners could draw dots or anything. Most important is check on whether they have displayed understanding of orders of matrices

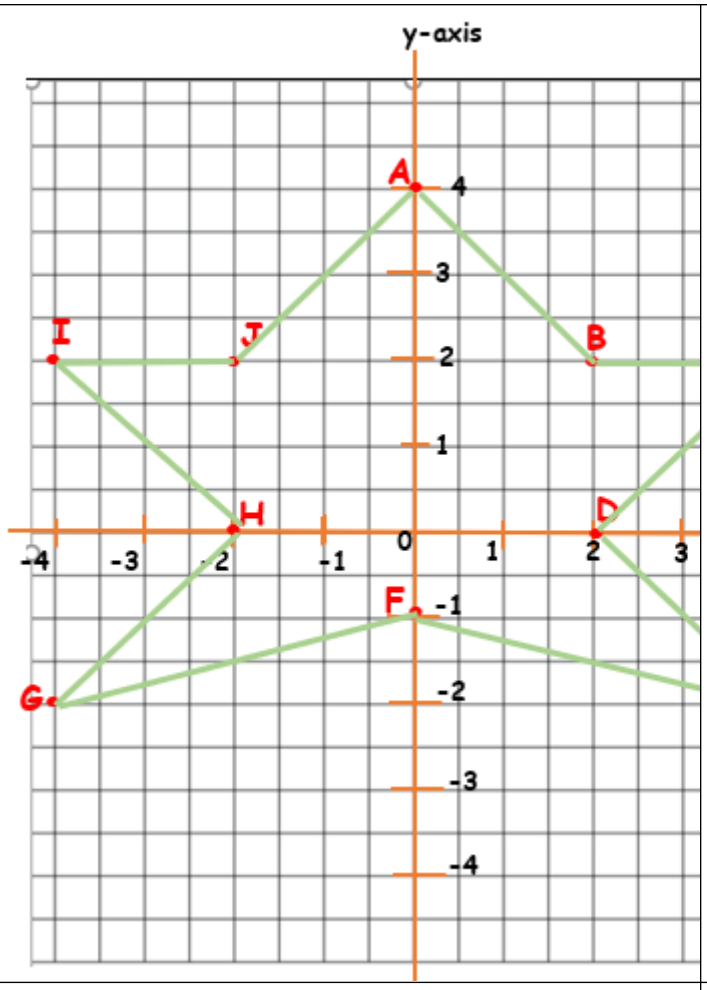
			
TOTAL		04	

9 a. b.	Let the translation be $\begin{pmatrix} x \\ y \end{pmatrix}$ A + T = A^1 $\begin{pmatrix} 2 \\ -3 \end{pmatrix}+\begin{pmatrix} x \\ y \end{pmatrix}=\begin{pmatrix} 5 \\ 2 \end{pmatrix}$ 2+x=5 X=5-2 X=3 -3+y=2 Y=2+3 Y=5 T= $\begin{pmatrix} 3 \\ 5 \end{pmatrix}$ $\begin{pmatrix} 2 \\ 4 \end{pmatrix} + \begin{pmatrix} 3 \\ 5 \end{pmatrix} = \begin{pmatrix} 5 \\ 7 \end{pmatrix}$ B^1= (5,7)	1 Mark 1 Mark 1 Mark 1 Mark	For correct translation statement. For correct translation written. For correct addition. For writing the correct coordinate.
TOTAL		04	
10	Let the price of the camera be x. 1st reduction of 20% $\frac{80}{100}$ of x = $\frac{80x}{100}$ 2nd reduction of 25% $\frac{75}{100}$of $\frac{80x}{100}$ = $\left(\frac{75\times80}{100\times100}\right)x$ =$\frac{24x}{40}$ 3rd reduction of 40%	1 Mark 1 Mark 1 Mark	Learners may use another method by compounding the percentages; follow through and award accordingly.

	$\frac{60}{100}$ of $\frac{24x}{40}$ =216,000 $\frac{3}{5}\times\frac{3x}{5}$ = 216,000 $\cancel{25}\times\frac{9x}{\cancel{25}}$ = 216,000××25 $\frac{9x}{9}=\frac{216,000\times25}{9}$ X =600,000	1 Mark	
TOT		04	
	SECTION B (60 Marks)		
11 a. b.	 The garden is in rectangular form. But the rectangle has two right angled triangles. Area of each triangle is equal to half area of the rectangle. The area of a rectangle is obtained by A= L×W Area of rectangular garden is ab m^2 The rectangle has been divided into two right angled triangles hence; $\text{Area}=\frac{1}{2}a\times b$ ∴ Area of triangular garden is $\frac{1}{2}abm^2$ Drawing the rectangle correctly with angles shown. drawing the diagonal.	1 Mark 1 Mark 1 Mark 1 Mark 1 Mark 1 Mark 1 Mark	Recognise the area of the rectangle. For mentioning triangle. For mentioning 1 right angled triangle. Explains that you obtain area of the two triangles after dividing the rectangle. For writing the correct expression in terms of A, a and b

c. d.	Shading the Area of a right-angled triangle as shown.  $464.52m^2=\frac{1}{2}\times 15.2\times a$ $464.52m^2=\frac{15.2a}{2}$ $\frac{464.52}{7.2}=\frac{7.2a}{7.2}$ $a=64.5m$ $\therefore$ the width is 64.5m	1 Mark 2 Marks 1 Mark 1 mark 1 Mark	Shaded part can be any portion, but shows meaning of the space covered which is AREA. for correct substation in the formula for area of triangle. For solving and simplifying. For correct value. For stating it as width. For correct use of units.
TOTAL		15	
12 a.	Jane's explanation is not correct when reading and plotting coordinates, you begin with the x-coordinate followed by the y-coordinate.	1 Mark 1 Mark	For mentioning that you begin with x-coordinate. For mentioning that you then follow with y-coordinate.

-4 -3 -1 0

		10 Marks 3 Marks 1 Mark 1 Mark	Award 1 Mark each for each coordinate plotted correctly. There are 10 coordinates A to J. For joining points correctly to form polygon. For identifying the line of symmetry. For writing the correct equation of the line of symmetry Equation of a line of sym is x=0 or the y-axis
TOTAL		15	
13	a) PointC will map triangle ABC onto DEC b) The geometrical name given to point C is the Centre of rotation. c) ABC undergoes through 180 degrees clockwise or 180 degrees anticlockwise. d)The transformation that would map ABC onto DEC is a Rotation about point C through $+180^0$ or -180^0. e) BC is a mirror line/mediator/perpendicular bisector (check for this answer am not sure) f) The transformation which maps ABC onto A^1BC is a reflection in the line BC.	2marks 1marks 2 marks 4 marks 3 marks	For identifying point C. For the centre of rotation. 1mark for each angle. 1 mark for stating rotation. 1 mark for the centre. 1mark for +180 1mark for -180 For stating a mirror line.

	The points B and C are invariant. The distance from A to line BC is the same as the distance from A^1 to the mirror line.	3 marks	For describing the transformation.
TOTAL		15	

14	a) Let the number of students be x (check the question I worked with the old one) 40% of x are boys Total number of boys = 40%x 30% of the boys are in a boarding section . 30% of 40%x = $\frac{30}{100} x \frac{40}{100} x$ =72 $\frac{12}{100} x$ =72 12x = 7200 X =600 There are 600 students b)The number learners in a boarding section. Number of girls in the school 60% of 600 =360 girls Girls in the boarding section=50% of 360 =180 girls Total number of learners in boarding section 180 + 72 = 252 . c)Learners not in a boarding section 600 - 252 = 348 $\frac{348}{600} X 100$ = 58%	4marks 5 marks 6 marks	1mark for the total number of boys expression. 1mark for equating the explanation to 72. 1 mark for cross multiplication. 1 mark for total number of students. 2marks for the number of girls in the school. 1 mark for the number of girls in the boarding section. 1 mark for addition. 1 mark for the answer. 4 marks for getting learners who are not in boarding. 1 mark the multiplication. 1 mark the percentage.
TOTAL		15	

END

UGANDA LOWER SECONDARY EDUCATION EXAMINATION

Mathematics

Paper 2 (Functional Mathematics)
Sample paper 2021
2 hours

LOGO

UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Lower Secondary Education

Mathematics

Paper 2

2 hours

CANDIDATE NAME: _____

CANDIDATE NUMBER: _____

CENTRE NUMBER: _____

THIS PAGE IS FOR EXAMINER USE ONLY

Do not write in the boxes on this page. The examiner will use them to keep a record of your marks.

Qn	1	2	3	4	5	6					Total
Marks scored											

INSTRUCTIONS

1. Answer **only** four questions.

2. Each number carries 25 marks
3. Pay attention to the number of marks available for each question.
4. Show all the working and explanation on the answer sheets provided.

Question One

In order to improve on the livelihood among the community, the government has embarked on distribution of improved seeds to boost the yield of agricultural product in **Nwoya** district, **Koch Goma** sub-county which has 4 wards. The wards are A, B, C and D. Basing on the size of land in each ward for every 100 packets of seed, ward **A** gets 30 packets, ward **B** gets 20 packets, ward **C** gets 40 packets and ward **D** gets 10 packets. The government has procured

45,000 packets which are allto be shared equitably according to the community.

By using a statistical graph, help the local leaders to distribute these seeds to the community in wards.

(25 Marks)

Question Two

The caterer of a school located in Makindye division -Kampala city is required to buy food stuffs for a school party. The foodstuffs to be bought include: 100 kg of rice, 150kgof meat and 200kg of Irish potatoes. The cost is UGX 3500, UGX15,000, and UGX1500 per kg of rice, meat and Irish potatoes respectively in Nakasero farmers' market. The same items cost UGX. 3000, UGX. 12,000 and UGX. 1,100 per kg of rice, meat and Irish potatoes respectively, in Kalerwe farmers' market. To hire a pick-up from Nakasero farmers' market to school costs UGX 60,000 while a pick-up hire from Kalerwe farmers' market is UGX95,000.

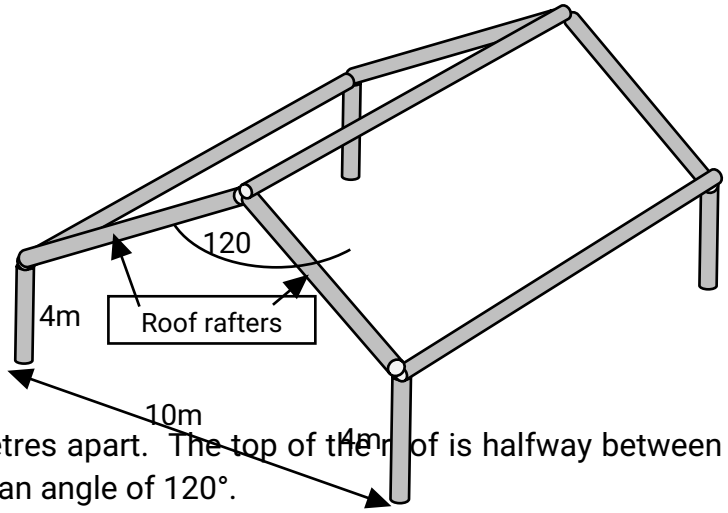
(a) What would be the easiest way to display the information provided above?

(b) Using the information provided above, how would the caterer decide on where to do the shopping from? Justify your answer.

(25 Marks)

Question Three

Hadija a small-scale farmer stays in a very hot environment and wants to build a shed for her cattle. She has sketched the framework of the milking shed as shown below.



The walls are 10 metres apart. The top of the roof is halfway between the walls. The sloping roof rafters meet at an angle of 120°.

a. construct a scale drawing of the cross-section of the milking shed.

b. What scale have you used?

c. What is the length of the roof rafter?

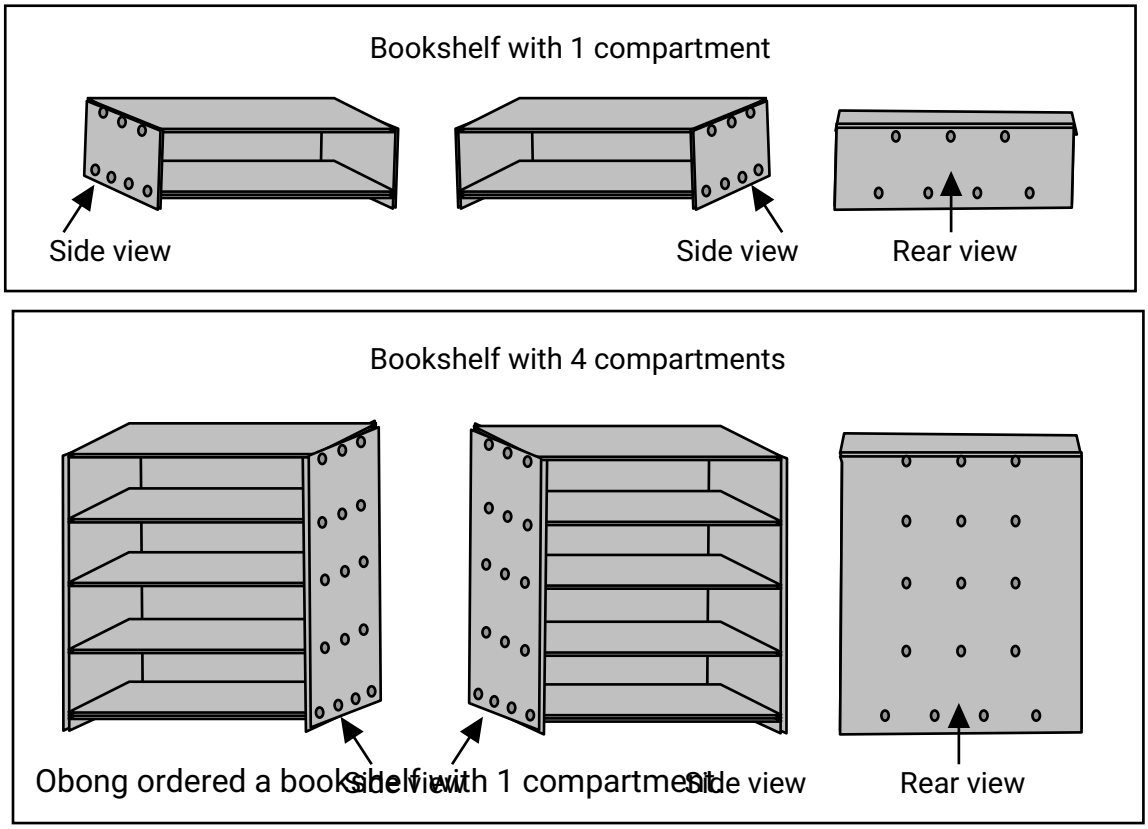
d. What is the angle of inclination of the roof?

e. Sketch the same roof if the angle of inclination is more than what you obtained in (d) without changing the dimensions of the milking shed.

(25 Marks)

Question Four

Janat is a carpenter. She specialises in making bookshelves with different numbers of compartments. She uses 12 nails for the base of a bookshelf, and 9 more nails for each compartment in the bookshelf.



Obong ordered a bookshelf with 1 compartment.

Achen ordered a bookshelf with 2 compartments.

Nambi ordered a bookshelf with 3 compartments.

Mugisha ordered a bookshelf with 4 compartments.

a) Complete the table to show the number of nails that Janat used to make each of the four bookshelves.

Number of compartments	1	2	3	4
Number of nails				

b) Janat recognised a pattern in the number of nails he used to make the bookshelves with 1, 2, 3 and 4 compartments.
(i) Write two numbers to complete this algebraic expression to show the number of nails (n) that Janat needs to make a bookshelf with b compartments.

□ + □ × b = n

(ii) What does the first number in the algebraic expression represent?

(iii) What does the second number in the algebraic expression represent?

c) Janat received a new order, for 4 bookshelves with 6 compartments. She has to buy nails.Nails are sold in kilograms. In a kilogram there are 32 nails. Each kilogram costs UGX 5,000.

How much did Janat pay for the nails for the new order?

(25 Marks)

Question Five

Okot wants to paint his room. The floor of the room is 5*m* long and 4*m* wide. The room is 3*m* high. The room has two doors each fixed in the walls that are opposite to each other, both 2*m* high and 75*cm* wide. It has one window in one of the longer walls. It is 1m square.

a) Draw a sketch of Okot's room. Indicate the measurements of the floor, height, doors and window.
b) A painter charges UGX 800 per square meter. How much money will Okot pay for the painter?
c) A 4-litre tin of paint costs UGX 70,000 and it paints 12*m* square of the wall. The walls already have an undercoat paint.
   i) How many tins would Okot need to buy in order to paint his room?
   ii) How much money will Okot require to paint his room?

(25 Marks)

Question Six

John would like to continue with his studies at A-Level. He is challenged with raising tuition of UGX 200,000. John is gifted with a skill of making jewelry crafts. He has saved some money that can only help him buy glue and strings. So, he moves to different homes requesting for old calendars. From the old calendars, he makes necklaces and earrings. A necklace takes him an hour to make and sells for a profit UGX800. The pair of earrings takes him two hours to make but he gets a profit of UGX2000. He likes to make a variety by making at least as many necklaces as pairs of earrings.

He has approximately 40hours per week for creating jewelry. He also knows that the

crafts show vender wants sellers to have more than 20 items on display at the beginning of the show. Assuming he sells all his inventory, help him find;

(i) how many of each of necklaces and earrings he should make to maximise his profit.

(ii) how much profit he makes in a week.

(iii) how many weeks he requires to raise his tuition?

(25 Marks)

END

SAMPLE EXAMINATION PAPER

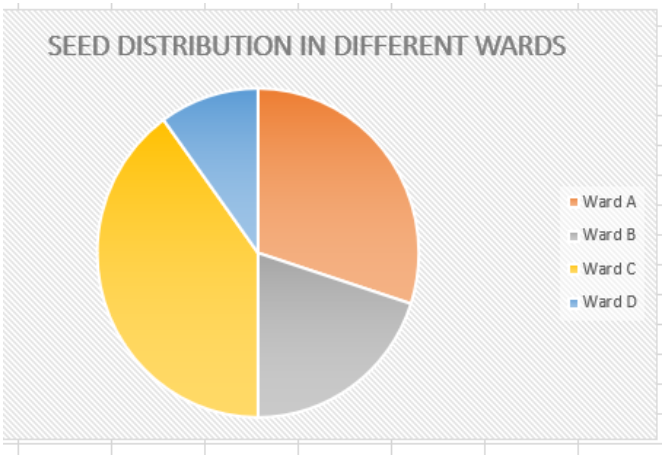
UGANDA LOWER SECONDARY EDUCATION EXAMINATION

PAPER TWO

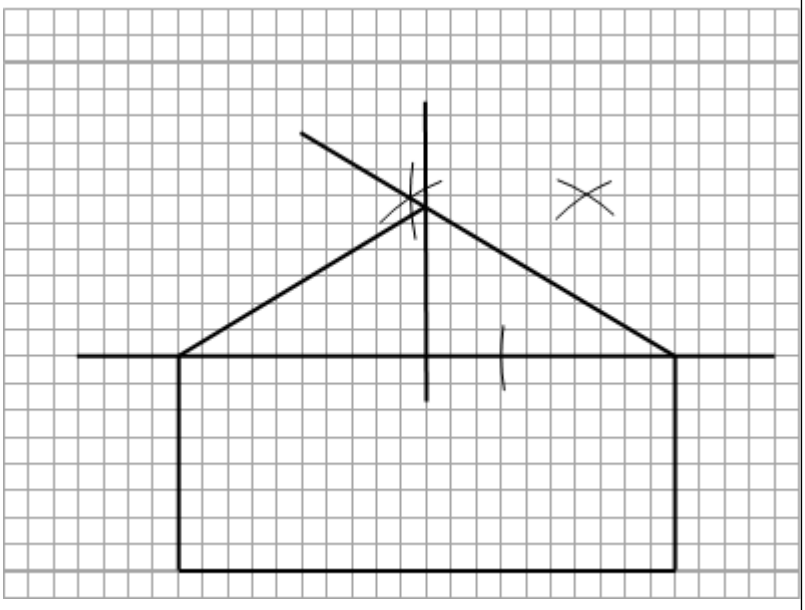
MARKING GUIDE

MATHEMATICS

QN	SOLUTION	SCORE	COMMENT
TOTAL MARK IS 100%			
1	<table><tr><th>Ward</th><th>Packets of seeds</th></tr><tr><td>A = $\frac{30}{100}$</td><td>$\frac{30}{100} X\ 45,000$ =13,500</td></tr><tr><td>B = $\frac{20}{100}$</td><td>$\frac{20}{100} X\ 45,000$ = 9,000</td></tr><tr><td>C = $\frac{40}{100}$</td><td>$\frac{40}{100} X\ 45,000$ = 18,000</td></tr><tr><td>D = $\frac{10}{100}$</td><td>$\frac{10}{100} X\ 45,000$ = 4,500</td></tr></table> The statistical graph used is a pie chart.	2 marks 2 marks 2 marks 2 marks	1mark for calculating 30%0f 45,000. 1mark for the answer 1mark for calculating 20%0f 45,000. 1mark for the answer 1mark for calculating 40% of 45,000. 1mark for the answer 1mark for

	Angles in a pie chart Ward A =13,500 $\frac{13,500}{45,000} X\ 360$ 108^0 Ward B = 9,000 $\frac{9,000}{45,000} X\ 360$ 72^0 Ward C = 18,000 $\frac{18,000}{45,000} X\ 360$ 144^0 Ward D= 4,500 $\frac{4,500}{45,000} X\ 45,000$ 36^0 	2 marks 2 marks 2marks 2 marks 2marks 7 marks	calculating 10% of 45,000. 1mark for the answer. 2 marks for stating a pie chart. 1 mark for calculating $\frac{13,500}{45,000} X\ 360$ 1 mark for the angle. 1mark for $\frac{9,000}{45,000} X\ 360$ 1mark for the answer. 1 mark $\frac{18,000}{45,000} X\ 360$ 1mark for the answer. 1 mark $\frac{4,500}{45,000} X\ 45,000$ 1 mark for the answer. Correctly drawn pie chart with tile, degrees accurately constructed.
TOTAL		25	

2	a) The easiest way is to put the information in a matrix form(table form) 	Item	Quantity
---	---
Rice	100kg
Meat	150kg
Irish	200kg | $\begin{bmatrix} 100 \\ 150 \\ 200 \end{bmatrix}$ (Here it can be any order) Cost of items per kilogram (UGX) in the two markets. | Item	Nakasero market	Kalerwe market
---	---	---
Rice	3,500	3,000
Meat	15,000	12,000
Irish	1,500	1,000 | $\begin{bmatrix} 3,500 & 3,00 \\ 15,00 & 12,000 \\ 1,500 & 1,000 \end{bmatrix}$ 100 150 200 . (This matrix is supposed to be close to the matrix down because it is multiplication) $\begin{bmatrix} 3,500 & 3,00 \\ 15,00 & 12,000 \\ 1,500 & 1,000 \end{bmatrix}$ (The learner can use any order that is compatible 1x3 3 x2 = 1 x 2 100 X 3,500. 150 X 15,000. 200 X 1,500 100 X 3,000. 150 X 1 2,900 ,000 2,300 ,000. Nakasero market is 2,900,000 + 60,000 UGX. 2,960,000 Kalerwe market is 2,300,000+ 95,000 UGX. 2,395,000 After calculations the caterer found out that Kalerwe market was cheap.	2 marks 2 marks 1Mark 3marks 2marks 4 marks 3marks 2marks 2marks	Identifying the method to use. Writing the items in a table form. For writing in a matrix form. Forputting the information correctly in the table form for a specific market. Changing the information in a matrix form. 2marks for identifying the correct order of the item matrix 2 marks for the price matix. 2marks for correct. multiplication 1mark for addition. 1 mark for each answer. 1 mark for

		2 marks 2 marks	adding transport. 1mark for the answer. 1 mark for adding transport. 1mark for the answer. 2 marks for stating the market.
TOTAL		25	
3. a.		2 marks 2 marks 2 marks 2 marks	Identifies or uses the midpoint of the base. shows intention to construct a 30° angle where the rafter meets the wall. Constructs one 30° angle accurately. Constructs the other 30° angle.Accurat

		2 marks	ely*(Accept an angle in the range 29° to 31° for a 30° angle).* Completes the diagram of the two rafters meeting at an angle of 120°. *All*
b.	1:100; 1 cm to 1 m; centimetre = metre; 2 units on the grid is a metre	3 Mark	*constructions must be done using a compass and a straight edge (not a protractor).*
c.	A value between 5.6 and 5.9 metres.		
d.	Angle of inclination of the roof is 30^0	4 marks	*Award all 5 marks for a correct construction, provided this was done using a compass and straight edge only.*
e. An gel e o	Can sketch the roof with any angle more than 30^0. Check if learners understand the meaning of say 50^0 as a sketch and the implication it will have with the pitch angle.	3 Marks 5 Marks	Gives a correct scale.

<table>
<tr><td></td><td></td><td></td><td>Note: the correct value to 5 sig fig is 5.7703.
If their diagram is incorrect, award only 1 mark for the length of one of their rafters, provided this was measured to the nearest mm.

Award I mark each for the two angles of inclination, angle at the pitch, the dimensions of the rafters remain the same as the original sketch and the sketch.</td></tr>
<tr><td>TOTAL</td><td></td><td>25</td><td></td></tr>
<tr><td>4</td><td>a)
<table><tr><td>Number of compartments</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Number of nails</td><td>21</td><td>30</td><td>39</td><td>48</td></tr></table>b) i)The algebraic expression is 12 + 9b = n
ii)The first number is a constant.

iii)The second number is the pattern
c) Janats new order of 4 shelves of 6 compartments.</td><td>8marks

2mark

1 mark

2</td><td>2 marks for adding 12 +9.
2 marks for adding 21 +9.
2 marks for adding 30 +9.
2 marks for adding 39 +9.
1 mark for 12 and
1 mark for</td></tr>
</table>

4	5	6
48	48 +9 =57	57 +9 =66

Total number of nails =48 + 57 + 66 = 171 nails
1kg pack = 32nails(need to add nails are packed in 1kgpack)

Janet needs $\frac{171}{32}$ ≈ 5.34 kg

But nails are sold in packs of 1kg so Janet will buy 6 kgs of nails

Janet paid 5000 X 6 = 30,000
UGX.30,000.

marks

3 marks

3marks

2marks

1mark

2 marks

1Mark

stating it is a constant.
1 mark for stating it is a pattern.

1 mark for48.
1 mark for 57.
1 mark for 66.
2 for adding

1 for the answer.

1 mark for division.
1 for the answer.
1 mark for stating 6.

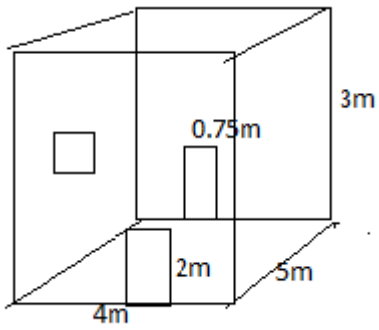
For multiplication .

For the answer.

TOTAL		25	

5

a) A sketch of Okot's room. The window is 1sq. metre



10marks

7 marks

4 marks for the sketch.

1mark for locating 3m.

1mark for locating 5m.

1mark for locating 4m.

1mark for locating 2m.

1mark for locating 0.75m.

	b) Area needed tobe painted Total area of the wall – Area of doors and window. 2(5X3) + 2(4X 3) - 2(2 X 0.75) + (1 x 1) 54 - 4 = 50 sq.metres A painter charges UGX800 per sq.metre Okot will pay 50 X 800 = UGX.40,000 C) 4 litres paint 12 sq. metres i) 50 sq.metres will use $\frac{50}{4}$ ⍰ 4.1 but paint is sold in 4 litres Okot will need 5 litres of paint ii) 5 X 70,000 = 350,000 Cost of paint Total amount = 350,000 + 40,000 = UGX390,000	8 marks	1mark for locating. 2 marks for the area of the walls. 1 markfor the areaof the two doors and the window. 1 mark for subtracting. 1 mark for the answer. 1mark for multiplication . 1mark for the answer. 1 mark for dividing. 1 mark for the answer(4.1). 2 for using 5litres and the reason.

			1mark for multiplication . 1 mark for the answer. 1 mark for addition. 1 mark for the answer.
TOTAL		25	
6	Let x be the number of necklaces and y the number of pairs of earrings. $x + 2y \leq 40$ $x + y \leq 20$ $x \geq y$ $x \geq 0$ $y \geq 0$ To get profit : $p = 800x + 2000y$ Forms tables of values for the equations; $x+2y=40$, $x+y=20$ and $x=y$ Plots any two coordinates for each of the equations $x+2y=40$, $x+y=20$ and $x=y$, $x=0,y=0$ Joins the coordinates for each of the equations with a dotted line for $x+y=20$ Joins the coordinates for each of the equation with a solid line for $x+2y=40$ and $x=y$, $x=0,y=0$ Shades the un-wanted region for all the inequalities $x + 2y \leq 40$ $x + y \leq 20$ $x \geq y$ $x \geq 0$ $y \geq 0$ marks the feasible solutions from the feasible region. (i) Maximum profit occurs at coordinate (12,14) i.e he needs to	2marks 3 marks 3 marks 4 marks 2 marks 2 marks 3 marks	Defines the variables. A ward 3 marks for writing all the inequalities and the profit function. 1 mark each for each table of coordinates. 1 mark each for a correctly For shading correct region. Maybe wanted or unwanted. Follow through learners' work.

		make 12 necklaces and 14 pairs of earings. (ii) Using p=800x+2000y = 800×12 + 2000×14 = 9600+28000 p= UGX.37,600 (iii) He requires a total of 5 weeks to raise his tution by saving his profit.	1 mark 1 mark 1 mark 1 mark 1 mark 1 mark	For obtaining correct coordinate, For mentioning the number of necklaces and earrings. For correct substitution. For obtaining correct profit. For dividing the tuition with the profit. For obtaining the number of weeks.
TOTAL			25	