456/1
MATHEMATICS
PAPER 1
July/August 2025
$2\frac{1}{4}$ hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

MATHEMATICS

Paper 1

2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES:

This paper consists of **two** *sections;* **A** *and* **B.** *It has* **six** *examination items.*

Section **A** *has* **two** *compulsory items.*

Section **B** *has* **two** *parts;* **I** *and* **II.** *Answer* **one** *item from each part.*

Answer **four** *items in all.*

Any additional item(s) answered will **not** *be scored.*

All *answers* **must** *be written in the Answer booklet(s)/ sheets provided.*

Graph Paper is provided.

Silent non-programmable scientific calculators and mathematical tables with a list of formulae may be used.

SECTION A

Answer all items from this section.

Item 1

Musa bought 25 text-books and 35 exercise books at Ugx. 135,000 from Kampala modern styles bookshop. From the same bookshop Menya bought 24 text books and 38 exercise books and spent Ugx. 13,000 less than Musa's expenditure.

In Mukono bookshop the cost of a text book is 5% less and that of an exercise book is 5% more than in Kampala modern styles bookshop. Menya still bought the same number of text books and exercise books and even Musa from Mukono bookshop.

Task:

(a) As a senior four student, help Musa and Menya to find out the price of an exercise book and a text book in Kampala modern styles book shop.

(b) Which bookshop would you advise Musa and Menya to buy from and why?

Item 2

Aisha and Zaharah are sisters who visited their parents on 1st-June-2025. On that day, Aisha resolved to visit their Parents every after five days while Zaharah resolved to visit them every after eight days, however Aisha is wondering whether they can ever visit their parents together in the near future for purposes of organizing a party for them.

Aisha is twice as old as Zaharah, they have both agreed to contribute to the party in the ratio of their ages. Zaharah found out that she will contribute Ugx 650,000, Aisha has to borrow 30% of her contribution which she had to withdraw from her account using a four-digit pin in base five after converting 179_{ten}.

Aisha can wash plates in four hours while Zaharah can wash the same number of plates in six hours. They are planning to work together on the party day but they don't know how much time they will take.

Task:

(a) Help Aisha to determine the date in the near future on which they can hold the party.

(b) Determine the amount Aisha borrowed.

(c) Help Zaharah to find the actual four-digit pin to use.

(d) Determine the time they will both take to wash the plates.

SECTION B

*This section has two parts; **I** and **II***

Part I

Answer only one item from this part.

Item 3

A poultry farm has three units; Sunrise, Meadow and Harvest. Each unit produces eggs and broilers with the following monthly output.

Sunrise: 25 trays of eggs and 25 broilers.

Meadow: 50 trays of eggs and 20 broilers.

Harvest: 40 trays of eggs and 15 broilers.

The farm sells each tray of eggs at Ugx. 10,000 and each broiler at Ugx. 20,000. The farm pays VAT of 20%. To optimize the packing process, the farm owner Mr. Owens decides to weigh a sample of 900 eggs and classify them according to their mass (in grammes) as shown in the frequency table below:

Mass in grammes	35 – 39	40 - 44	45 – 49	50 - 54	55-59	60 - 64
No's of eggs	40	180	320	210	120	30

Task

(a) Find the:

   (i) Total sales of the farm if all the eggs and broilers were sold.

   (ii) Total income from the sales of the farm every month.

(b) (i) Determine the median mass of an egg to the nearest value from the table above.

   (ii) What would be the percentage of eggs that would be classified as larger? (over 54 grammes)

Item 4

The sports teacher of your school is taking learners to participate in post primary games. The main games that the school will participate in are football, volleyball and Netball. However, he decides that they will participate in other games if the probability of getting a learner that plays none of the three games is more than 0.15. His target is to take more than 60 learners who play either football or volleyball. All the 75 learners he is taking play at most two games, 9 play only football, 12 play only volleyball and 5 play only Netball. 10 learners play volley ball and netball. 32 play football or volleyball but not Netball. The number of learners who play football is equal to those who play volleyball.

Task

(a) (i) Determine the number of learners who play none of the three games.

   (ii) What is the probability of selecting a learner who plays none of the games?

(b) Is the teacher's target reached; give a reason for your answer.

PART II

*Answer only **one** item from this part.*

Item 5

Francis deals in buying and selling of land. He has a plot of land on sale at Ugx. 15,000,000 cash. However, he also sells it at hire purchase by accepting a deposit of 60% of the cash price and then pay Shs. 815,000 per month for a year. Zura does not have cash and she wants to buy this plot but she is not sure of the total amount she will pay for it.

Francis has a land surveyor to mark the boundaries of the plot. The surveyor marks three points O, A and B in a triangular form on which $\overline{OA} = \underset{\sim}{a}$ and $\overline{OB} = \underset{\sim}{b}$. Points C and D are placed in the middle of OA and AB respectively. Another point E is to be marked on BC such that $\overline{BE} = \frac{2}{3}\overline{BC}$. Francis wants to know if Points O, E and D are collinear so that he pays the surveyor.

Task:

1. (a) What is the total amount of money that Zura will pay for the plot?

(b) (i) Express the vectors $\overline{BE}$, $\overline{OE}$ and $\overline{BD}$ in terms of $\underset{\sim}{a}$ and $\underset{\sim}{b}$

(ii) Should Francis pay the surveyor?

Item 6

Your sister works as a production manager of a company that deals in manufacturing of school laboratory supplies. The company has received an order of making 1420 pyramids for a certain school. The school wants a Pyramid with a square base measuring 6 cm and slanting edge of 7 cm. Your sister must submit a sketch that is to be folded to make the Pyramid that the school wants but she is finding it hard. The company packs the pyramids in a box that measures 66 cm by 24 cm by 15 cm and the manager wants to know the number of boxes that will be needed to pack all the pyramids that the school wants, as there only 5 boxes available in stock.

The company manufactures and sells each Pyramid at Shs. 25,000 and the company manager receives a commission of 12% on the first 500 pyramids and then 8% on the pyramids excess of 500. Your sister wants to know the total commission she will receive from the order made by the school.

Task

(a) (i) Help your sister to sketch the diagram she is to submit.

(ii) How many pyramids can be packed in the box?

(iii) Are the available boxes enough for the pyramids ordered for?

(b) Obtain the total commission that your sister will get from the order.

END

456/1
MATHEMATICS
Paper 1
July – August 2025
2 ¼ Hours

UGANDA MUSLIM TEACHERS' ASSOCIATION

UMTA JOINT MOCK EXAMINATIONS – 2025

Uganda Certificate of Education

MATHEMATICS

Paper 1

2 Hours 15 Minutes

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- *This paper consists of* **two** *sections;* **A** *and* **B**. *It has* **six** *examination items.*
- *Section* **A** *has* **two** *compulsory items.*
- *Section* **B** *has* **two** *parts;* **I** *and* **II**. *Answer* **one** *item from each part.*
- *Answer* **four** *examination items in all.*
- *Any additional item(s) answered will* **not** *be scored.*
- *All answers* **must** *be written in the answer booklet(s) provided.*
- *Graph paper should be provided.*
- *Silent non-programmable scientific calculators and mathematical tables with a list of formula may be used.*

SECTION A

Answer **both** *items in this section.*

Item 1.

A community is planning to build a new community center. The initial budget is "five billion seven hundred million Uganda shillings." The project involves various stages.

In the initial stages, they will need **48700** concrete bricks at **UGX 8,930** each, **891** bags of cement at **UGX 28,500** each, **553** steel bars at **UGX 69,000** each, **143** trips of sand at **UGX 280,000** each, and project labor which is **25%** of the initial budget. They will mix water, cement and sand in the ratio **1:2:4.**

The architects use Computer-Aided Design (**CAD**) software. Some of the software's file formats involve storing measurements using binary (**base-2**). Two specific points, **D** and **T**, on the blueprint are represented as **101101** and **000000** respectively. The blueprint is on a scale of **5cm** to **5m**.

Task:

(a) How much of the initial budget is not used after the initial stages of the project?

(b) If they need **18** cubic meters of mixture (water, cement and sand), how many cubic meters of water, cement and sand are required.

(c) Help the construction team interpret length **DT** in feet (**1 ft = 0.3048m**).

Item 2.

An entrepreneur acquired a piece of land and she was excited to build a small poultry farm with **two** types of chicken layers (for eggs) and broilers (for meat).

The cost of raising one-layer chicken until it starts laying eggs is **UGX 15,000**, and the cost of raising one broiler chicken to market weight is **UGX 10,000**. She has a total budget of **UGX 500,000** for purchasing and raising the initial batch of chicks. Each layer chicken produces an average of **250** eggs per year, and each egg sells for **UGX 200**. Each broiler chicken can be sold for an average of **UGX 25,000** UGX. She wants to achieve a target Annual Revenue of **UGX 1,500,000.**

Her chicken house has a limited capacity. Each layer chicken requires **0.5** square meters of space, and each broiler chicken requires **0.3** square meters. Her chicken house has a total usable floor area of **30** square meters. At the store, she was offered **two** options that fit in her budget: either **35** broilers and **10** layers, or **27** broilers and **15** layers.

Based on data from other farmers, the demand of broilers in the local area has been steadily growing as: **Year 2021: 15000**, **Year 2022: 16500**, **Year 2023: 18500**, and **Year 2024: 21000**.

Task:

(a) Find the number of layer and broiler chickens that satisfy both her budget and revenue goals.

(b) Help her figure out the option at the store that optimizes the capacity of her chicken house.

(c) Estimate the demand of broilers in the year **2029**.

SECTION B

This Section has **two** *Parts;* **I** *and* **II.**

Part I

Answer **one** *item from this part.*

Item 3.

A manager of a small but popular restaurant in his town wants to understand the dining habits of his customers to optimize staffing, manage inventory, and plan promotions. Over a busy weekend (Friday and Saturday), he decided to record the total amount (in Ugandan Shillings) spent by each customer group.

Here's the data he collected from **50** customer groups:

25000, 38000, 15000, 52000, 40000, 30000, 28000, 65000, 22000, 45000,
35000, 58000, 18000, 48000, 32000, 55000, 20000, 42000, 37000, 60000,
27000, 50000, 16000, 44000, 33000, 59000, 23000, 47000, 39000, 62000,
31000, 53000, 19000, 49000, 36000, 57000, 21000, 43000, 34000, 61000,
26000, 51000, 17000, 46000, 35000, 56000, 24000, 41000, 30000, 63000

Additionally, it is known that the manager records the average spending of every **50** customer groups and he is also curious to know the amount spent by half of the customers. He requested one of the waiters to organize the data collected but the waiter did not know how to do it.

Task:

(a) (i) By creating a frequency table using groupings of the spending amounts into intervals of **UGX 10,000**, help the waiter to organize the data collected.

(ii) Using the frequency table in **(a) (i)**, help the waiter to determine the average spending of customers.

(b) Using a Cumulative Frequency Curve (Ogive), help her to determine the typical spending amount, where half the customers spend less and half spend more.

Item 4.

A certain district's youth development fund is **UGX 236,000,000**. This district has an offer of free airtime on its local radio station of **90 hours** a month. A newly appointed District Youth Officer wants to understand the participation of youth in different community activities. She conducted a survey of **100** youths in the district, asking about their involvement in **three** key areas: Sports (Participating in any organized sports team or individual sporting activity), Volunteering (Regularly volunteering time for community projects or organizations) and Entrepreneurship (Actively running their own small business or involved in income-generating activities). After collecting the data, she found the following: **45** participate in Sports, **30** are involved in Volunteering, and **35** are involved in Entrepreneurship, **15** participate in both Sports and Volunteering, **10** participate in both Sports and Entrepreneurship, **8** are involved in both Volunteering and Entrepreneurship and **5** participate in all the **three** activities. This data will enable her understand the overlaps and make informed decisions about resource allocation and program development.

Task:

(a) Three youths are randomly selected one after the other. Find the probability that the **3** are in the same community activity.

(b) Using the ratio of; numbers in sports only numbers in volunteering only: numbers in entrepreneurship only, distribute the youth development fund.

(c) Using the ratio of; numbers in sports and volunteering only: numbers in volunteering and entrepreneurship only: numbers in entrepreneurship and sports only, distribute the radio airtime.

Part II

Answer **one** *item from this part.*

Item 5.

A family purchases a plot of land, with no deed, to build a house. The plot is an irregular quadrilateral marked **ABCD** such that **AB** = **30m**, **BC** = **12m**, **AD** = **20m** and **DC** = **29m**. The side **AB** is directly in the line of movement of the sun with mark **B** in the direction of the sun set.

The family works with an architect to design their house. The architect has advised that the house be positioned in a circular space with the boundaries of this circular space just touching sides **AB**, **AD**, and **DC**. Interlocking blocks of length **440mm** are to be used to demarcate this boundary.

The architect is to be paid a monthly gross salary **UGX 4,867,000**. Her plan is to save **25%** of her net pay. Her salary is subject to income tax as charged below.

Monthly gross pay	Tax rate (%)
Not exceeding 235,000	Nil
Exceeding 235,000 but not exceeding 335,000	10
Exceeding 335,000 but not exceeding 410,000	20
Exceeding 410,000	30

Task:

(a) The deed to the land describes its area and boundaries using bearings to define the direction of each side relative to North. Using an accurate drawing of the plot of land, help the family present a deed to the land.

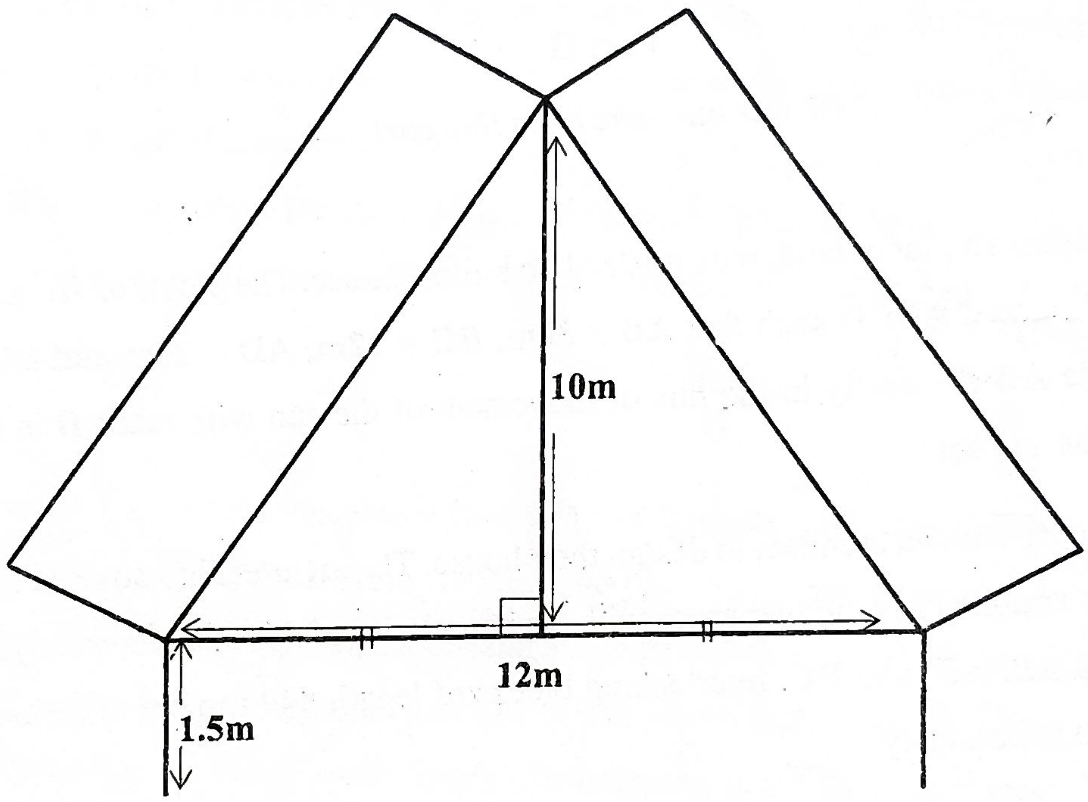
(b) How many interlocking blocks will be used to demarcate the boundary of the circular space?

(c) Compute the amount the architect saves monthly.

Item 6.

An architect has designed an outdoor stage for a performing arts center.

Two-dimensional illustration of the stage



The whole outside surface of the stage is to be covered with wood panels of uniform thickness measuring **20cm** by **80cm** each.

Task:

(a) Draw an accurate **three-dimensional** illustration of the stage stating all the lengths involved.

(b) How much space is occupied by the stage?

(c) How many pieces of wood will be just enough to cover the outside of the stage?

END

456/1
MATHEMATICS
Paper 1
Jul/Aug 2025
2¼ Hours

JINJA JOINT EXAMINATIONS BOARD

Uganda Certificate of Lower Secondary Education

MOCK EXAMINATIONS - JULY / AUGUST 2025

MATHEMATICS

2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES;

This paper consists of two sections; **A** *and* **B**. *It has six examination items.*
Section **A** *has* **two** *compulsory items.*
Section **B** *has* **two** *parts;* **I** *and* **II**. *Answer one item from each part.*
Answer **four** *(4) examination items in all*
Any additional item(s) answered will **not** *be scored.*
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Graph paper will be provided
Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.

 Turn Over

SECTION A

Answer **all** *items in this section*

Item 1

John has 4 adopted children at his home whom he takes care of. He wants them to share five hundred twenty thousand shillings as their term 2 pocket money in the ratio of their ages. They are aged 5, 10, 12 and 13 years respectively.

He deposits their school fees in three installments with 60% as the first installment at the beginning of the term, $\frac{2}{3}$ of the remaining amount by VD and the rest of the fees balance amounting to shs 160,000 at the end of the term.

He also makes follow up visits at school every after 21days and also attends weekly meetings at his workplace. On 11^{th} /05/2025, they had a meeting and it is when he visited school.

Task:

(a) Determine how much pocket money will each child get.

(b) Determine the amount paid for a child in the;

(i) first installment

(ii) second installment.

(c) When is he likely to have a meeting and a follow up visit at the same time?

Item 2

At Wanyange eggs and nutritional center, they sell trays of eggs and sugar. One day, a young boy bought 4 trays of eggs and 3 kg of sugar and paid shs. 58000. On the same day, another boy from neighboring home was given shs. 40,000 and he bought 2 trays of eggs and 4 kg of sugar and remained with only shs. 1000. The parents of these children failed to know the prices of a tray of eggs and that of a kilogram of sugar since the two children were not given receipts. At the same center, they also sell cartons of juice and cartons of water. The number of cartons of water sold per day are always **less than** twice the number of cartons of juice sold. Each carton of water is sold at shs. 5,000 and that of juice at shs. 4,000 and they always make sales of a **minimum** of shs. 200,000 per day. The number of cartons of water sold are **at least** 25. There is a profit of shs 700 on each carton of water and shs 600 on each carton of juice. The profits made per day **does not exceed** shs. 42,000.

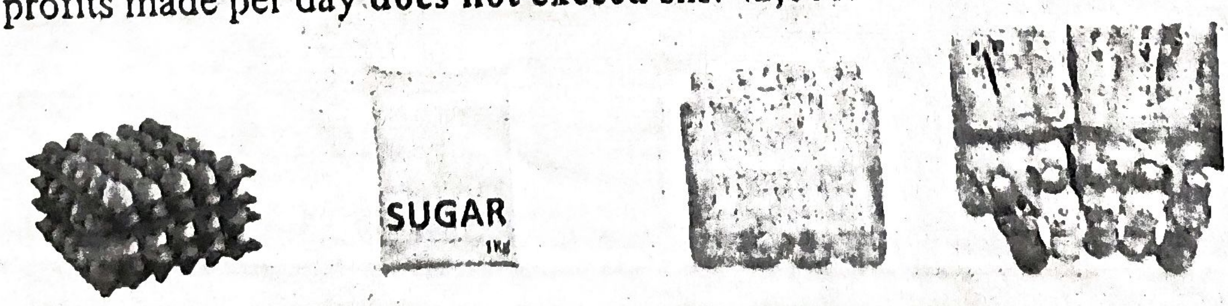

Fig 1. Items sold at Wanyange eggs and nutritional center.

Task;

(a) Help these two parents to determine the price of a tray of eggs and a kilogram of sugar.

(b) (i) Form mathematical constraints from the above information

(ii) Show the feasible region for the constraints in (b)(i) above.

(iii) Determine the number of cartons of each type that can be sold per day to maximize profits.

(iv) What is the maximum profit made from the optimal sales?

SECTION B

This section has two parts; **I** *and* **II**

Part I

Answer **one** *item from this part*

Item 3

As a requirement for the NLSC, learners in a certain institution have to opt for either Foods and nutrition (F), Fine art (A) or Chinese (C)as a language. Out of 120 S.1 learners who joined the institution this year, 40 opted to do Fine Art, the number of learners who opted to do Chinese is twice the number of those who opted to do Foods and nutrition. The Head teacher agreed to purchase new Chinese textbooks if the probability of a learner taking Chinese is greater than 50%. In the first month, some learners were still finding out which subject they can take and some ended up studying more than one subject. 10 learners studied all the three subjects, 25 studied Foods and nutrition and Fine Art, 10 studied only Fine Art ,12 studied only Foods and nutrition and Chinese.

Task

(a) Should the Head teacher buy more Chinese textbooks? Justify your answer.

(b) Determine the likelihood that a learner studied more than one subject.

(c) Determine the number of learners who opted for the required number of subject(s).

Item 4

Maize farmers in a certain village have decided to form a producer cooperative society if the average produce is less than 50bags and they are also calling for government help through their leaders. Leaders have accepted to help them with either fertilizer, seedlings or ready market.

Farmers with less than 25bags are to be given fertilizers.

Farmers with more than 25 bags but less than 55 bags are to be given seedlings and those farmers with more than 55bags are to be provided with ready market. A sample of 40 farmers was interviewed after harvesting and their produce (in bags) were recorded as follows;

11	38	14	60	71	48	52	21	28	17
45	59	45	37	65	68	35	56	43	47
25	42	59	62	79	21	52	65	48	34
22	34	51	18	49	43	54	64	27	38

Task:

(a) Should farmers form a producer cooperative society or not? Justify your answer.
(b) Determine the number of farmers that will be provided with;
(i) fertilizers
(ii) seedlings
(iii) ready market.

Part II

Answer **one** *item from this part.*

Item 5

Uncle Collin wants to invest shs. 12,000,000 in a hard ware business. He wants to use his savings which is 45% of what he needs and plans to get a loan for the remaining amount. He approached a money lending institution with lending terms as;

10% pa simple interest for 3 years.

Interest and principal must be paid in equal monthly installments.

He is a secondary school teacher who earns a monthly salary of shs 990,000 which is subjected to PAYE as a government requirement according to the tax structure below;

Taxable income (shs)	Tax rate (%)
0 – 100,000	0
100,001 – 200,000	5
200,001 – 350,000	10
350,001 – 500,000	18
Above 500,000	25

At this school, they also give the following allowances to their teaching staff members on a monthly basis. Lunch shs. 80,000, accommodation shs. 170,000, medical shs. 55,000, transport shs.3000 daily and children allowance for only 3 children; below 10 years shs. 7,000, between 10 and 15years shs. 10,000, above 15years but less than 18years shs. 12,000. Uncle Collin has 5 children aged 3, 7, 14, 17 and 21years.

A month has 30 days

Task

(a) Determine the amount of money that uncle Collin pays to the money lending institution monthly.
(b) How much does Uncle Collin pay to the government as tax?
(c) How much does Uncle Collin earn as his net income?

Item 6

A certain metal and fabrication workshop has been contracted by a school make a cylindrical metallic water tank of diameter $12ft$ and height $2.5m$. The tank is made up of metallic pieces of dimensions 8ft by 4ft only and each sold at shs. 80,000.

They want to the paint outside part of the tank excluding the bottom part with paint which is sold in either jerry cans or cylindrical tins. A sealed jerry can which costs shs. 23,000 can paint $300ft^2$. and a sealed tin which costs shs. 14,000 can paint $200ft^2$.

Given that $1m = 3.3ft$.

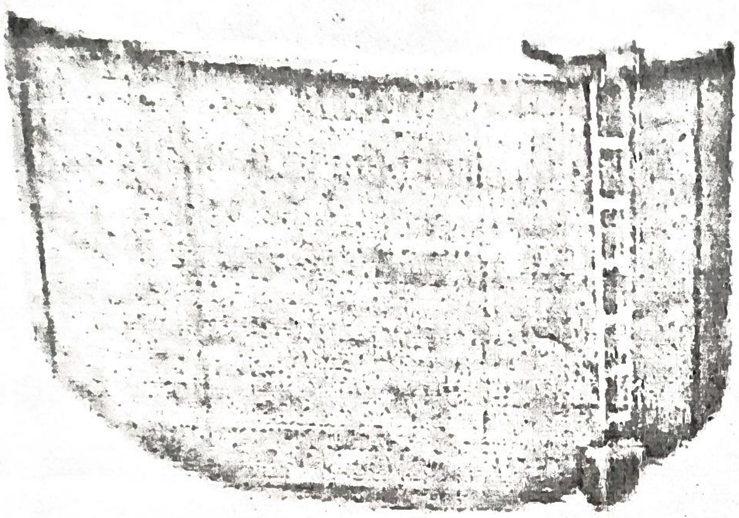

Fig 2. The cylindrical metallic water tank

Task

a) Determine the number of pieces of material required to make the tank.
b) How much money is used to buy the required pieces of material?
c) Should they use paint in jerry cans or tins? Justify your answer.

456/1
MATHEMATICS
Paper 1
Jul/Aug.2025
2 ¼ hours

UGANDA TEACHERS' EDUCATION CONSULT (UTEC)

Uganda Certificate of Education

MATHEMATICS

Paper 1

2 hours 15 minutes

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Graph Paper is provided.

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Item 2

In Mango village, poverty was at its peak. Therefore a vibrant youth group launched a small-scale enterprise under the "Youth Boost Elevation Project (YBEP)", aimed at reducing unemployment and empowering rural youth through entrepreneurship.

They ventured into making and selling handmade bricks using local materials. During the first five weeks, they recorded the number of bricks sold and observed a consistent pattern in their weekly sales.

Week (x)	1	2	3	4	5
Bricks sold(y)	250	270	290	310	330

They noticed the pattern in sales and modelled future sales using the function:
$y = -x^2 + 12x + 20$
Their profit (in thousands of Uganda shillings) was modelled by the linear equation:
$P = 500{,}000x + 20{,}000$

Tasks

a) i) Find an expression for the nth term of the sequence.
   ii) Use your expression to calculate how many bricks they would sell in week 10.

b) Using a scale of 2 cm:1 unit on the x-axis and 1 cm:100 bricks on the y-axis, draw the graph of ;$y = -x^2 + 12x + 20$ and line $y = -2.5x + 65$ for which $0 \leq x \leq 12$.
   i) Find the maximum number of bricks sold and the week this occurred.
   ii) On the same graph, estimate the number of weeks for which;
   $85 + 14.5x - x^2 = 0$.
   iii) Based on your findings assess whether the current model is sustainable.

SECTION B:

This Section has **two** *Parts; I and II*

Part I

Answer **one** *item from this part*

Item 3

In Namwendwa, vendors track and improve profitability while staying compliant with tax, food, and quality inspection policies.
Vendor activity has significantly increased, especially in the trade of cereal seeds such as maize, millet, sorghum, and simsim.
To regulate this booming activity and ensure hygiene and fair trade.

The district council introduced a market tax of UGX 1,500 per day per vendor.
A fixed daily lunch fee of UGX 2,000 was also established for all vendors.

Additionally, a quality inspection officer conducts daily random cereal inspections from each vendor to check seed purity and uphold market standards.
Three regular vendors; Nabiryo, Mutesi, and Baguma, are known for consistent cereal seed trade.

The items sold are shown below:

Vendor	Maize(kg)	Millet(kg)	Sorghum(kg)	Simsim(kg)
Nabiryo	20	15	10	5
Mutesi	10	20	15	5
Baguma	15	5	10	10

Each cereal has a cost price per kg:

Cereal	Cost Price (UGX)
Maize	1,200
Millet	1,500
Sorghum	1,000
Simsim	2,000

The vendors add different mark-ups (profit margins) per kg:

Vendor	Mark-up per kg (UGX)
Nabiryo	300
Muteesa	400
Baguma	200

Tasks

a) Represent the quantities and cost price of cereals sold by each vendor as;
   i) a 4×3 matrix A.
   ii) a 1×4 matrix B respectively.

b) By use of matrix multiplication, compute the total;
   i) Cost for each vendor, including Market tax and Feeding cost.
   ii) Expected sales revenue and net profit.

c) Based on your findings, advice the Namwendwa community on how to stay compliant with taxes, food regulations and handle risks of inspection

Item 4

In a rural secondary school in Iganga district, a class teacher wanted to select a class captain from three candidates Andrew, Badul, and Cathy. He distributed voting slips to 116 students, instructing them to tick the name(s) of their preferred candidate(s). After collection, the teacher found that:

20 students ticked both A and C.

18 students ticked A and B.

9 students ticked only B and C.

42 students ticked B in total.

20 students ticked only C.

Those who ticked B only were half the number of those who ticked only A.

The number of students who ticked A and C but not B was equal to those who ticked none.

The teacher wishes to find out how many students supported each candidate and identify the most preferred candidate.

Tasks:

a) Determine the number of students who ticked A and C respectively.

b) Identify the candidate preferred by the majority.

c) Assess whether the elected candidate is likely to lead the class easily, using percentages to support your reasoning.

PART II

Answer **one** item from this part

Item 5

Mukasa, a local carpenter in Kasese, specializes in making wall clocks from rhombus-shaped boards. A client placed an order for a circular wall clock with an area of atleast $2826cm^2$. The board available is rhombus-shaped measuring 60cm, with slant sides meeting the base at angles of 60° and 120°, and its length and height known.

Mukasa wonders whether the largest possible circular clock can be cut from this board. If not, he must purchase a new one.

Mukasa employs two workers, each earning a gross salary of Shs.350, 000, which includes a total of Shs.70, 000 for meals and transport. Authorities have recently instructed that income tax must be deducted based on official tax bands.

Monthly taxable income(shs)	Tax rates (%)
0-100,000	0
100,001-200,000	5
Above 200,000	10

Tasks:

a) Using a scale drawing, determine whether the board can accommodate a circular clock of the required area.

b) Calculate the total income tax Mukasa is to remit to authorities for both employees.

c) Determine the net income Mukasa will pay to each employee after tax.

Item 6

Kumi district executive personnel identified a gap in picking spare parts from Kampala to the area. It has therefore advertised in the newspapers.

Ms. Asio, a resident of Kumi Municipality, has taken up the initiative to operate a spare parts dealership with a capital of UGX 1 billion. As her business expands, she begins to explore advanced financial services to ensure sustainability and long-term growth. She decides to save part of her capital in a fixed deposit, insures her business and property, acquires land through a mortgage plan, and invests in a delivery van that appreciates in value. At the same time, she tracks her depreciating old machines and plans accordingly, projecting growth and understanding value changes over time.

Ms. Asio saves UGX 200 million in a fixed deposit account for 3 years at an annual compound interest rate of 9%, and takes UGX 400 million mortgage to purchase a warehouse. The mortgage has an annual interest rate of 6%, and she pays in equal annual instalments over 5 years.

She buys a delivery van at UGX 60 million. The van appreciates at 4% annually due to its limited edition status.

She owns a spare parts machine worth UGX 120 million, which depreciates at 15% per year.

Her insurance company charges 2.5% per annum on the insured value of UGX 900 million.

Tasks:

a) Determine the amount at the end of 3 years and the interest earned.

b) Establish the total amount payable and her annual mortgage instalment.

c) Determine the value of the ;

   i) van after 3 years and its increase in value

   ii) Machinery after 4 years and the total loss in value after 4 years.

   iii) Premium she pay annually and the total premium paid over 5 years?

d) Justify the relevance of mortgage in the community.

END

456/1
Mathematics
Paper 1
July/August 2025
2¼ hours

BUGANDA EXAMINATIONS COUNCIL MOCKS

Uganda Certificate of Education

MATHEMATICS

PAPER 1

2HOURS 15 MINUTES

INSTRUCTIONS TO CANDIDATES

- This paper consists of **two** sections A and B. It has six examination items
- Section **A** has **two** compulsory items.
- Section **B** has two parts; **I** and **II**. Answer **one** item from each part.
- Answer **four** examination items in all
- Any additional item(s) will not be scored.
- All answers must be written on the answer sheets provided.
- Graph paper(s) is/are provided.
- Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.

SECTION A

Answer all items in this section

Item One

After the death of Tom, his family convened two months later to his home and read his will to which you were invited. During the meeting, a surprise revelation emerged when his youngest child revealed a mysterious envelope left by the dad, containing a secretive message. The envelope contained a piece of paper with the number 31 which needed to be converted to a ternary numeral system to unlock the secret code to gain access to his safe deposit box. But to their dismay, none of the family members recalled how to perform the conversion, and yet the secret code gives access to his safe deposit box.

Upon opening the safe deposit box, they discovered a staggering three hundred forty nine million Ugandan shillings, and a will outlining the distribution of the wealth. The will stipulated that the wife was to receive 40% of the total, the eldest son was to receive one-third of the remaining amount and the rest was to be shared among the three remaining children in the ratio 2 : 4 : 5 according to their birth order.

After the meeting, Tom's sisters agreed to check on the orphans after every twelve weeks while the clan elders scheduled to meet them after every twenty-four weeks to comfort the family in the late's home for the next one year.

(a) Help the family access the safe deposit box.

(b) Show how the family can allocate the funds as stated in the will.

(c) If the meeting took place on 1st May 2025, when shall Tom's sisters meet again with the clean elders in the same venue?

Item two

A wholesaler wishes to transport 870 crates of soda from a factory. He has a lorry which can carry 150 crates at a time and a pick-up truck which can carry 60 crates at a time. The cost of each journey for the lorry is shs. 25000 and for the pick-up is shs. 20,000. The pickup makes more journeys than the lorry because it travels faster. The amount of money available for transporting the soda is shs. 220,000 the wholesaler's profit function is represented by $f(x) = 100x^2 + 4$, where **x** is the number of crates sold and the profit is in shillings. The number of crates sold is expected to increase according to the function $g(x) = 2x + 1$, where **x** represents the number of days since the start of a promotional campaign.

Task:

(a) How many journeys should the lorry and the pick-up make so as to keep the transport cost as low as possible. State how much money the wholesaler saves by making these journeys.

(b)i) Find the composite function fg (x) that represents the profit as a function of the number of days since the promotional campaign began.

(ii) Calculate the profit 5 days after the campaign starts.

SECTION B

This section has two parts I and II

Part I

Answer **one** item from this section

Item 3

A grocer in standard supermarket in Kampala is planning to introduce fried chicken in the supermarket. He undertakes a research to find out people's opinion on the weight of this package that will cost Ugx 12,000. The collected data was recorded as below:-

Weight (grams)	Number of people
1 – 10	8
11 – 20	14
21 – 30	12
31 - 40	9
41 - 50	7

Task

(a) Giving a reason based on computations using the collected data, suggest the suitable weight of fried chicken to be put on the menu.

(b) The supervisor of standard supermarket wishes to know the number of people who prefer a weight greater than 25g. Help him/her to estimate this number of people.

Item 4

Fifty-two tourists from UK were interviewed to find out how many of them had ever visited the following national parks of Uganda: Queen Elizabeth, Kidepo valley, Kabalega by a tour guide. Only 4 had visited neither parks. It was discovered that an equal number of tourists had visited Queen Elizabeth and Kidepo valley of whom 12 had visited both Queen Elizabeth and Kidepo valley. 24 tourists altogether had visited Kabalega of whom 11 had visited both Kabalega and Queen Elizabeth and 13 had visited Kabalega and Kidepo valley. Eight had visited all the three National Parks.

Task

(a) Help the tour guide establish how many tourists had ever visited
  (i) Kidepo valley,
  (ii) Not visited Queen Elizabeth National Park

(b) Given that three tourists were taken atrandom from the list, what is the probability that they belong to the set of tourists who only visited two parks?

Part II

Answer one item from this part

Item 5

Moses is a carpenter working in your school. The director of studies of the school has contacted him to make a wooden box to keep examination papers. The box is to be made from a material whose area is $422.8cm^2$, and its base will measure 12.4cm by 5.5cm. Because Moses did not go to school to study carpentry, he is finding it difficult to come up with a sketch he will follow to arrange all the faces for the box to fold and he will make using the provided information.

For each wooden box, Moses is paid shs.950 and he has been tasked to make 500 wooden boxes on condition that he makes them according to the required standard design. He has a plan of using all the money he will be paid to buy a land which he will sell after 2 years because he targets to get shillings one million six hundred thousand out of it. The land appreciates at a rate of 80% per annum and he does not know if he will achieve his target or not.

Task

(a) As a Mathematics student, help Moses to

(i) Come up with a sketch showing the details he needs

(ii) Calculate the height of the box he is to make

(iii) Determine the volume of the box he is to make

(iv) Will Moses achieve his target?

Item 6

A Surveyor is tasked with mapping out a triangular plot ofland for a new development project. The plot has vertices labeled A, B and C. The Surveyor noted that the bearing of point B from point A is 065° while that of point C from A is 140°

The surveyor decided to move from point A to point B covering a distance of 150 metres. On another day when he was at point C, he was tired and opted to go back to point A by riding a bicycle covering a distance of 200 metres.

In the new development project plan, the surveyor is tasked to plant flowers round the triangular plot of land passing through its vertices.

Before the surveyor could start the work, he was again given another assignment in another location.

Task

(a) The surveyor has now tasked you to;

(i) Construct the triangle ABC using geometric construction techniques

(ii) Measure and record the length of side BC

(iii) Determine the bearing of point **C** from point **B**.

(iv) Calculate the area of the triangle ABC and the size of the land available to plant the flowers.

END

456/1
Mathematics
Paper 1
July 2025
2 ¼ hours

U1286/016

JESSE MIRACLE

ACEITEKA JOINT MOCK EXAMINATIONS 2025

Uganda Certificate of Education

MATHEMATICS

Paper 1

Time: 2 Hour 15 Minutes

INSTRUCTIONS:

- This paper consists of *two sections,* **A** and **B** with six examination items.
- Section A has ***two compulsory*** items
- Section B has *two parts,* answer ***one item from each part***
- Answer four examination items in all
- Any additional items answered will not be scored
- All answers must be written on the answer booklets provided.
- Graph papers may be provided
- Silent non-programmable calculators and mathematical tables may be used.

SECTION A

Attempt both items from this section.

Item 1

James hires 12 men to make 50m long cage for eggs. It took them 3 days, he was wondering the number of more men he will need to make a 75m long cage in 2days.

He later bought 360 trays of eggs at shillings 12,000 per tray. He discovered that 10% of the eggs were bad and he could not sell them. He was wondering the cost of the good eggs per dozen he must sell to make a profit of 50%.

James later forgot his mobile phone's password; he only remembers that the password was generated from the product of his age in base six and that of his daughter in base six. He is 45 years old and the daughter is 12 years old.

Task

Help James to determine,

(a) The number of more men he will need to do the work under the same conditions.

(b) The selling price of the eggs per dozen.

(c) His mobile phone password.

Item 2

A school headmaster wants to reward boys who attended a sports meeting. The student population in the mixed secondary school is 600.On a particular day one-fifth of the boys and one-quarter of the girls attended an assembly.468 students were left behind.

The headmaster is not sure whether 1,500,000/= will be sufficient to cover expenses in sixth week of the term, when all 60 teachers and 600 students are present. The cost of feeding in a school day varies partly as the number of student and partly as the number of teachers present. On the first day of term 2, there were 25 teachers available and 300 students, totaling 600,000 spent. On the second day, 30 teachers reported, there were 450 students available and that 850,000/= had been spent.

Task

Help the headmaster to

(a) Find how many boys are to be rewarded.

(b) .Form an equation that can be used for other weeks of the term.

(c) Find out whether the school budget for the sixth week is enough for feeding.

SECTION B

This Section has two parts; **I** *and* **II Part I**

Answer one item from this part.

Item 3.

A company hires her employees following an interview. The interview which is conducted in rounds, aptitudes test and oral, an applicant qualifies for oral when he/she attain 75% of the scores in the aptitude test. The company manager does not know the number of successful applicants for oral interview. The aptitude's scores of the applicants were as follows

9.9	6.6	8.5	8.7	7.4	10.8	11.2
8.9	12.4	10.0	6.4	6.5	7.3	12.8
10.4	8.9	8.1	8.8	8.3	9.0	7.6
8.8	11.7	9.2	6.2	10.2	9.8	9.5
7.4	7.0	7.9	8.6	9.3	6.9	7.7
9.1	8.2	7.1	12.3	6.2.		

Task

Help the company to:

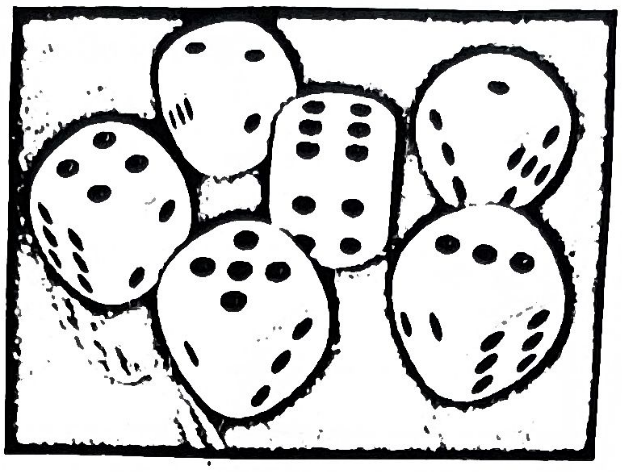
(a) Represent the data in a frequency distribution table using an interval of 1.0.

(b) Determine the scores with which half of the applicants scored.

(c) Determine the number of applicants who qualified for oral interview.

Item4

In a Ludo festival organized during Hero's day celebration, one wins a round if the sum of his scores on the dice is greater than 9 when two dice are rolled once.



The organizer asks 71 participants which animal (goat, sheep, or cow) should be awarded the prize. It was found out that equal numbers of participants liked goats and sheep. 10 participants liked goat and cow, 11 preferred cow and sheep, and 6 selected goat and sheep only. 26 participants liked cows, whereas 5 selected goat only. Participants who preferred cow only doubled those who preferred sheep only. If the probability of those who dislike all of the above is less than 50%, the winner would be given any of these animals.

Task

(a) Help the participants to determine the probability of getting a score greater than 9 in the festival.

(b) How many participants prefer all the three species of animal?

(c) Help the organizer to determine whether the winner shall be awarded one of the animals above.

Part II

Attempt any one item from this section

Item 5

Your Aunt owns a room that she plans to convert into a bathroom. The room's area is $4.7m^2$. She intends to use tiles that measure 24 cm by 30 cm. Your Aunt already has 5 boxes of tiles in her home. She realizes the wall tile she intends to use is not enough. So she wants your advice on how much extra she should buy.

A box of 6 wall tiles costs shillings 60,000/=.

She plan to use an employee and whom she pays a gross monthly salary of shillings 450,000.The gross monthly salary includes a non -taxable transport allowance of shillings 90,000/=,rent allowance of 100,000/= and medical allowance of 45,000/=.However, before she pays him, she has to deduct income tax as a requirement by the tax authority.

The tax bands are shown in the table below.

Monthly taxable income(shillings)	Tax rate (%)
0 - 100,000	0
100,001 - 200,000	5
200,001-300,000	15
300,001 - above	20

Your Aunt is having difficulty in using the tax bands.

Task;

(a) (i) How many more boxes tiles should she buy?

(ii) How much will she pay for the extra boxes of tiles?

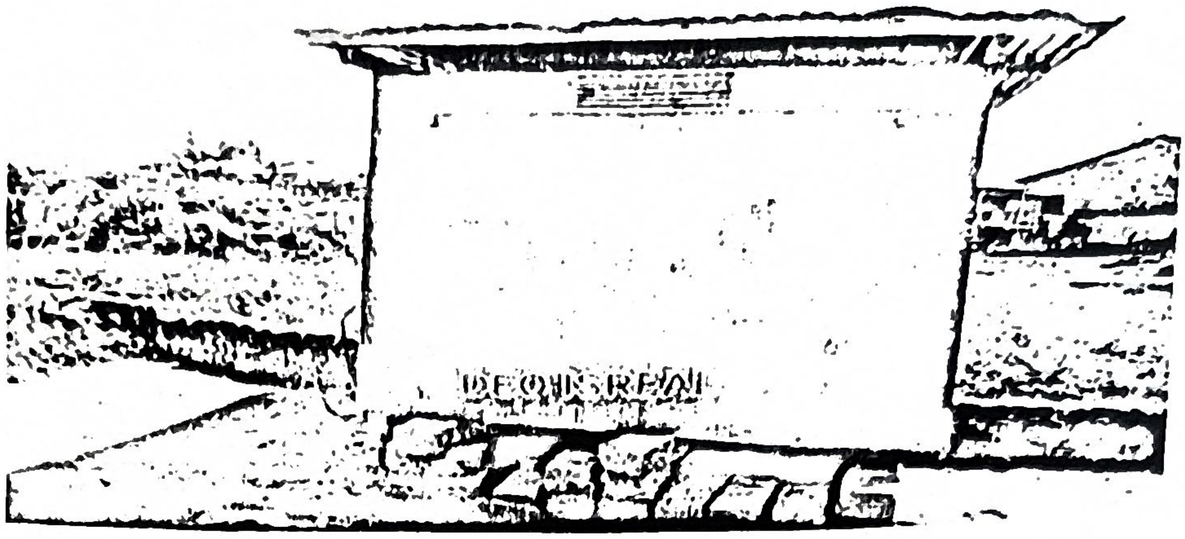
(b) How much will she pay the employee as net pay?

Item 6.

Juma a businessman decides to buy a piece of land at 4,000,000/=. He agreed with the seller to pay on hire purchase by paying 18% deposit of the cash price plus 10 equal monthly installments. He needs assistance because he does not know the monthly installment to pay.

Juma has 3.5 million, he contracted a welder to put a metallic container (kiosk) which measures 4m by 200cm by 2.5m on the land. The container should have a door measuring 120cm by 90cm and a window measures 80cm by 60cm made from a different material. A full piece of metallic plate costs 250,000/= and which measures 1.9m by 1.2m. He does not know whether his budget shall be enough for a container(kiosk).

Support material



Task:

Help Juma

(a) To find out the monthly installment he has to pay for the piece of land.

(b) To determine whether he will be able to afford the container.

THE END.

456\1
MATHEMATICS
PAPER 1
2025
$2\frac{1}{4}$ HOURS

JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

MATHEMATICS

Paper 1

2 Hours 15 Minutes

INSTRCTIONS TO CANDIDATES

*This paper consists of two sections; A and **B**. It has **SIX** examination items.*

*Section A has **TWO** compulsory items*

*Section **B** has two Parts; **I** and **II**. Answer **one** item from each part.*

*Answer **four** examination items in all.*

Any additional item(s) answered will not be scored.

***All** answers **must** be written in answer booklet(s) provided.*

Graph paper is provided

Silent non programmable scientific calculators and mathematical tables with a list of formulae may be used

SECTION A

(COMPULSORY)

Item 1

A certain member of your family re-wrote each digit of his 4-digit ATM card pin from number system base ten to another number system less than four. Now he is sick in the hospital, he can neither talk nor write but money on his account is needed to finance hospital bills. Here is how he wrote the pin 12 20 22 10. Assuming that you have been able to encrypt the ATM pin for the family and funds are available to take care of him.

The hospital has a nurse who takes care of him after every two hours and a medical doctor who checks on him after every four and a half hours. Both medical personnel last checked on him together at 9:30am. He was treated well and discharged and advised as follows;

He was advised to spend three eights of the day resting, one sixth of the day eating, two thirds of the remainder having a healthy diet and the rest of the time of the day visiting the hospital for further checkup.

TASK

a) Which number system do you think he used to re-write the pin and why?

b) Use the identified number system to help your family members to regenerate the pin.

c) At what time will both the nurse and doctor check on him again at the same time?

d) How many hours of the day does he have to spend visiting the hospital?

Item 2

Your family is planning to design a parking lot for the day and night parking of vehicles using the piece of land they have bought in the middle of the city. They hope to construct a rectangular parking lot such that its length is 3m more than its width covering an area of $108m^2$. The parking lot is to accommodate pickups and mini buses at any time. Each pickup is allowed $15cm^2$ and each minibus is allowed $25cm^2$of parking space. There is only $400cm^2$ of space available for parking. Not more than 35 vehicles are allowed in the park at a time. Both vehicles are allowed in the park but at most 10min buses are allowed at a time.

TASK

i. Help the family members to know the actual length and width of the rectangular parking 1st they are intending to build.

ii. Write all mathematical statements to show the relation between vehicles and the parking space.

iii. Represent the inequalities on a Cartesian plane.

iv. If the parking charge is sh 500for a pickup and shs 800 for a mini bus per day, how many vehicles of each type should be parked in order to maximize project?

SECTION B

Part I

(Answer one item from this part)

Item 3

Kelen supplies limited. A company that supplies food items to three schools as follows;

First week

JINJA SS;3 bags of posho, 2 bags of cassava.

JINJA COLLEGE;1 bag of posho, 2 bags of rice and 1 bag of cassava.

JINJA MORDERN;3 bags of posho and 1 bag of cassava.

Second week

JINJA SS;3 bags of posho and 2 bags of cassava.

JINJA COLLEGE;1 bag of posho,2 bags of rice and 1 bag of cassava.

JINJA MORDERN;3 bags of posho and 1 bag of cassava.

The prices posho, rice, and cassava are shs20800, shs30000and shs10000 respectively per bag. After the two weeks, he wanted to improve his mode of supply. He wanted to start supplying what is most preferred by the students in the schools. He decided to make a random survey among a selected number of students from all the three schools. All students sampled liked at least one of the food staffs.47 liked cassava(c) 53 liked posho(p) 23 liked posho only,10 liked cassavas only and 15 liked all the three food staffs. 45 liked rice(r) and 5 liked rice only.

TASK

a) Summarize the total amount of food stuffs brought by the three schools in the two weeks in matrix form.
b) Write a matrix for the costs of the food stuffs and hence determine how much each school spent to buy the food items for the two weeks.
c) How many students were picked for this survey?
d) If a student is picked at random, what is the chance that he prefers at most two food stuffs.

Item 4

The school head teacher is thinking of how to boost the math department of your school. He asked the department to give a test and these were the results obtained. he decided that he can either add more teachers or buy more textbooks or do both if the performance of the learners is lower than that of the previous year which was 47%

Below are the results:

50	71	40	48	61	70	30	62	44	63
60	51	55	25	32	65	54	45	65	50
45	40	25	45	48	45	30	38	30	28
24	48	30	48	28	35	50	48	50	60

He also visited the library and found that the previous candidates used three books for their revision i.e. longhorn, baroque and Inline. out of 35 candidates, 13 used longhorn, 20 used baroque and 17 used inline. 9 used longhorn and inline, 3 used longhorn and baroque while 8 used baroque and inline only. The records show that 2 used all the three.

TASK

I. Help head teacher group the marks to make an informed decision for the department.

II. Help the head teacher to know which book to replace (the book that was read only by the least number of students)

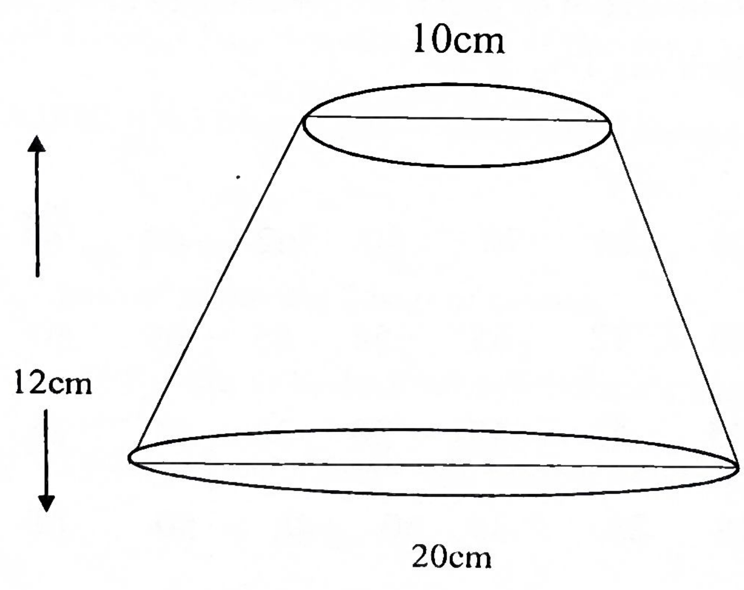
III. Find the probability that a student that picked randomly from the class reads at least two books

Part II

*(Answer **one** item from this part)*

ITEM 5

Your father has a milk producing business. The bucket below is of height 12cm.its upper and lower diameters are 10cm and 20cm respectively. He always gets 25 buckets daily of milk.



Mary and James are employees of your father's milk producing business. Mary is paid monthly gross income of shs500,000 while James is paid shs 650,000 monthly. The gross includes non-taxable allowances as shown below.

Transport	shs 480,000 per annum
Housing	shs 600,000 per annum
Medical	shs 30000 per month
Children	below 10 years – shs 5000 per month
	Above 10 years but below 18 years – shs 8000 per month.

Mary has two children aged 5years and 9years James has five children aged 8 13 17 19 and 21 years. The company taxes the workers using the system below.

Taxable income she	Rate %
0-50,000	5
50,000-120,000	10
120,000-200,000	15
200,000 and above	20

TASK

1) Calculate the daily amount of milk produced.
2) Determine each employee's net income.