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MATHEMATICS
Paper 1
Oct./Nov.2026
2¼ hours

UGANDA NATIONAL EXAMINATIONS BOARD

Uganda Certificate of Education

MATHEMATICS

Paper 1

2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES:

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

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

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

Respond to **four** *examination items* **in all**.

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

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

Graph Paper is provided.

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

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SECTION A

Respond to **both** *items in this section.*

Item 1

A manager of a company organised a sales promotion event in different market centres alongside a fundraising event that took place in the company. The sales promotion event had 27 female and 36 male workers. These were grouped into teams with each team having the same number of males and the same number of females.

The number of market centres visited were equal to the number of teams formed. This promotion increased the company sales by 18% from Shs48,000,000. During the fundraising, the board of directors (BOD) contributed ten million five hundred thousand shillings. The company staff contributed an amount that was $1\frac{1}{2}$ of the amount contributed by the BOD and the sales promotion team contributed 0.04 of the amount obtained after the increased company sales.

The total amount contributed during the fundraising was later donated to specific community schools and charity organisations in the ratio 5:7 respectively.

The BOD has requested the manager to generate information clearly showing the;

I. greatest number of market centres visited during the promotion,
II. number of female and male workers in each team,
III. amount to which the sales increased,
IV. amount donated to schools and charity organisations.

However, the manager has failed to generate the report and needs your help.

Task:

Provide the information needed by the BOD.

Item 2

Nalunga has a right-angled triangular garden whose base is 50 m and height is 30 m. She has been informed that she can double her harvest if she expands the garden to a total area of 2400 m^2 by increasing both the base and the height by the same number of metres without changing the shape of the garden. However, she does not know how to do it.

Nalunga has been buying 40 kg of seeds for planting in her garden from a supplier who has been charging her a total amount of Shs650,000 that included the cost of the seeds as well as a fixed transport cost for delivering the seeds.
With the expanded garden Nalunga will need 60 kg of seeds for planting. The supplier has informed her that she will be charged a total amount of Shs950,000 for both the cost of the seeds and the fixed transport cost for delivering the seeds.

Nalunga's neighbour has a total of Shs500,000 which she intends to spend on both the seeds and their transport for delivery but she is not sure of the number of kilogrammes of seeds the supplier will deliver.

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Task:

(a) Determine the;
  (i) number of metres by which Nalunga should increase each side of the garden.
  (ii) size of the base and the height after the increase.

(b) (i) Form an equation Nalunga and her neighbour would use to determine the amount of money to pay the supplier upon delivery of any number of kilogrammes of seeds.
  (ii) Inform Nalunga's neighbour, the number of kilogrammes of seeds the supplier will deliver for the total amount of money she intends to spend.

SECTION B

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

Part I

Respond to **one** *item from this part.*

Item 3

Hassad and Hajarah are planning to buy scholastic materials from the same shop. Hassad will buy 6 books, 4 pencils and 3 rubbers while Hajarah will buy 8 books, 5 pencils and 4 rubbers.

The price of each book, pencil and rubber is Shs3500, Shs600 and Shs200 respectively. Because prices are expected to increase in the near future, their parent has asked them to arrange the information about the materials as well as their respective prices in rows and columns, so that they request for money to buy **double** each of the materials they need. However, they do not know how to do it.

At the shop there is a back-to-school promotion where after buying scholastic materials, a customer has a chance of winning a gift of either a pen or a ruler by randomly picking two pieces of paper, one at a time, without replacement. If a customer picks two papers with the same item written on them, the customer wins the item.

There are 6 papers with a word **pen** written on them and 5 papers with a word **ruler** written on them.
Hassad and Hajarah wish to determine the probability of winning either a pen or a ruler.

Task:

(a) Organise the information as requested for by the parent.

(b) Determine the amount of money each one should request from their parent.

(c) Inform Hassad and Hajarah their chance of winning either a pen or a ruler.

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Item 4

A school has organized three seminars in three different terms of the year; the Science seminar, Arts seminar and Mathematics seminar.

Out of the 90 students of senior four, 42 have paid for the Arts seminar while 39 have paid for the Mathematics seminar. 15 students have paid for both the Arts and Mathematics seminars, 12 have paid for both the Science and Mathematics seminars while 21 have paid for both the Science and Arts seminars. The number of students who have paid for the Science seminar only is equal to the number of students who have paid for both the Science and Arts seminars only. Some students have paid for all the seminars. The ratio of the number of students who have paid for all the seminars to the number of students who have not paid for any of the seminars is 3:4.

On the day of the Science seminar, the teacher of English language wants to teach the remaining students only if the probability that a student selected at random from the entire class did not pay for the science seminar, is atleast 0.5.

Task:

Advise the teacher of English language, based on calculations, whether or not to prepare to teach the remaining students.

Part II

Respond to **one** *item from this part.*

Item 5

John, who lives in town A, is a Loans Officer from JK SACCO. He intends to move from home to town Z for a meeting and then proceed to town Y in the same direction to collect money from a client who took a loan from the SACCO.

Figure **1** shows a sketch map of the location of towns A, Z and Y.

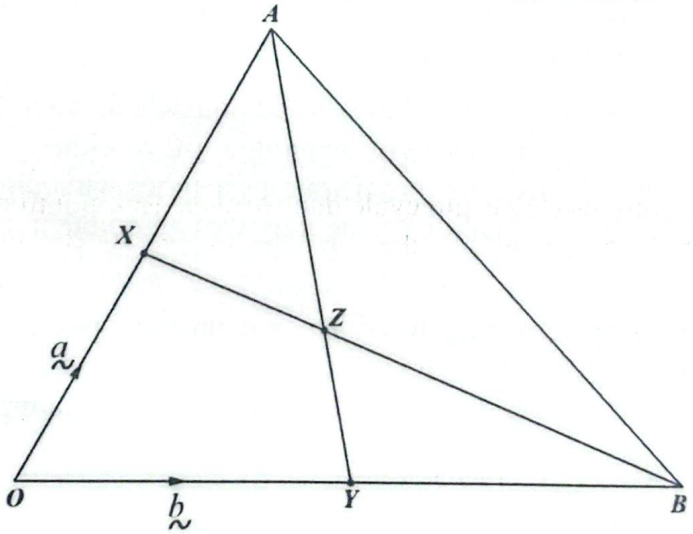


Fig. 1

X and Y are places in the middle of the routes OA and OB respectively. The routes XB and AY meet at Z. $OA = 2\mathbf{a}$, $OB = 2\mathbf{b}$ and $3XZ = XB$. AY is 60 km long.

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John needs to use the sketch map and the information given to establish the vector AZ in terms of AY so as to determine the actual distance of AZ.

In addition, John has to be in town Z by 8:00 a.m. He is not sure whether he will make it in time if he leaves home at 7:30 a.m, driving at an average speed of 50 km/h. The client at Y borrowed Shs3,000,000 at a simple interest rate of 10% per annum for a period of two years. However, the client is doubtful of the total amount of money he should prepare for John to collect.

Task:

(a) Determine the:
  (i) relationship between vectors AZ and AY.
  (ii) actual distance of AZ in kilometres.

(b) Establish whether John will make it in time for the meeting at Z.

(c) Advise the client on the total amount of money he should prepare for John to collect.

Item 6

A monument in form of a pyramid in figure **2** is to be constructed with base PQR, in which PQ = PR = 16 m and QR = 20 m. The vertex, V, is 13 m vertically above P. The outer faces of the monument will be covered with bricks and it is known that 28 bricks cover 1 m^2.

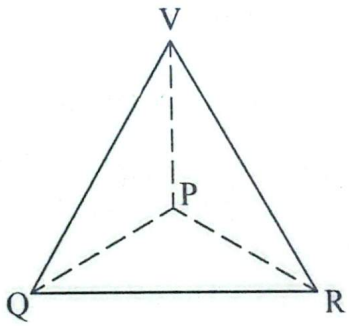


Fig. 2

A manager of a company that has been contracted to construct the monument intends to set off from his office and cycle due North at 15 km/h to move to the site of the monument. At the same time, the company supervisor also intends to set off from her home, 7.5 km due East of the Manager's office and cycle on a bearing of 340° so that she meets the manager before reaching the site of the monument. The supervisor however, does not know how fast she will have to cycle if she is to meet the manager.

The manager also needs to know the number of bricks that will be required for the outer face of the monument.

Task:

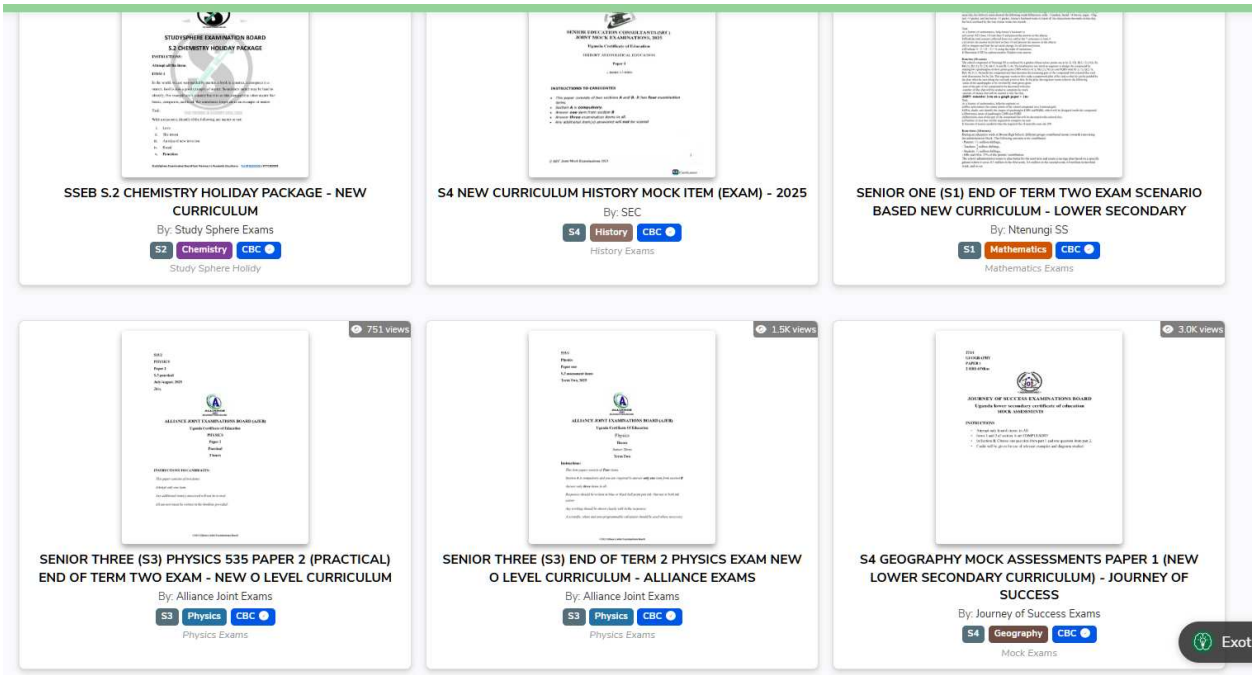
(a) Estimate, to the nearest 1000, the number of bricks that will be required.

(b) Recommend, based on calculations, the speed with which the supervisor will travel if she is to meet the manager.

END

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