

MERRYLAND HIGH SCHOOL-MASAJJA
END OF TERM II EXAMINATIONS 2025
SENIOR THREE MATHEMATICS

Paper 1

2 hours 15 minutes

INSTRUCTIONS:

- Section A has two compulsory items.
- This paper consists of two sections; A and B. It has six examination 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.
- 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 in this section.*

Item One

In your village, there are 120 adults who have been contributing twenty-four thousand, five hundred Uganda shillings each month to a village SACCO (Savings and Credit Cooperative Organization) for the last six months. They have opened an account where this money has been consistently deposited.

Recently, they want to withdraw some cash via a mobile agent using their platinum card, but none of them remembers the card's password. Your uncle, who is the treasurer of the SACCO, mentioned that the password was saved as 325 in base eight. However, the actual password is formed by the digits of this number when converted to base five, but he does not know how to do the conversion.

The group plans to withdraw 75% of the amount in their account to purchase a piece of land. The chairperson will supervise the land every 30 days, while the treasurer will supervise it every 24 days.

Tasks:

- (a) Determine the amount of money in their account after six months and inform your uncle about the amount they will be able to withdraw.
- (b) Help your uncle identify the digits of the password for the platinum card.
- (c) If the treasurer and the chairperson begin their supervision on the same day, after how long will they both meet on-site for supervision?

Item two

An engineer was contracted by a certain hotel to design a new parking lot. On reaching the hotel, the engineer picked up measurements for two straight lines perpendicular to each other. For the first line, he picked two points which he recorded as $(2, -4)$ and $(-6, 9)$ and for the second line he picked up only one point and recorded it as $(-4, 6)$.

The new parking lot is to be rectangular in shape, with its breadth 3 m less than its length. Its area is to be 4 square meters more than the area of the old parking lot whose shape is in form of an isosceles triangle of height 12 m with its base as the breadth of the rectangular parking lot. Now the engineer wants to know the exact measurements of their new parking lot.

Task:

Help the engineer to;

- Form the equations of the two perpendicular lines to help him develop an artistic impression.
- Determine the measurements of the rectangular parking lot.

SECTION B

This Section has two Parts; I and II

Part 1

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

Item three

At a school sports day there are 2 houses tiger and lion houses who are competing closely for the first position, the races left are the track and relay races, points are awarded for the first, second and third positions only the following table shows the points for each position.

	First	Second	Third
Track	3	2	1
Relay	7	5	2

During the races the performances recorded were as follows tiger house got 3 first, 4 seconds and nil thirds in the track events and 1 first, 2 seconds and 1 third in relays, while lion house had already calculated their total points for all the activities as 410, The house prefect of tiger house knows that they already have 387 points and wants to determine if they have been able to win lion house by determining the points they have got in the races.

After the sports day the sports master wanted to get a team of those who will participate in the regional school's competition, out of a total of 21 racers 15 were excellent at the track race while 10 were excellent at the relays, he needs to determine those who are excellent in both events so as to form his teams well.

Task

- By organizing the information in rows and columns determine the total number of points tiger house got in the races.
- Which house emerged the winner?

(c) Help the sports master to determine the number of participants who are excellent in both events.

Item four

A school nurse keeps a record of the height measured to the nearest centimeters of a group of students she treats for a certain infection at the school clinic. The data was summarized in the table below. Height (cm) Number of students.

Height (cm)	Number of students
110-119	1
120-129	3
130-139	10
140-149	28
150-159	65
160-169	98
170-179	55
180-189	15

It is assumed that the mean height of students is 154.5cm and the school administration wants to find out the average height and the height in which the greatest number of students treated falls.

Task:

- (a) Determine the average height of students measured.
- (b) Use a suitable graph to estimate the height in which the greatest number of students treated for the infection at school clinic falls.

Part 11

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

Item Five

Your school has three classroom blocks that are interconnected, forming a triangle with vertices A, B, and C. The sides of the triangle are as follows: AB measures 80 meters, BC measures 85 meters, and the angle at point B (angle ABC) is 75 degrees.

The school administration wants to install a flagpole at a location that is equidistant from points A, B, and C. They require your assistance to determine the exact location of this point using your construction skills.

Tasks:

- (a) Using a scale of 1 cm to represent 10 meters, construct an accurate diagram representing points A, B, and C. Estimate the length of classroom block AB in your diagram.
- (b) Construct a circle that touches points A, B, and C. Explain to the school administration where the flagpole should be positioned in relation to this circle.

Item Six

Your neighbor has recently built a house that is 15 meters tall. There is a small pathway in his yard that he wishes to have tarmacked. When he contacted a local engineering company, he was asked to estimate the length of the pathway, but he did not have a tape measure.

Later that day, while visiting your home, he mentioned that at 7:30 AM, the shadow of the house extended to one end of the pathway, and by 11:00 AM, it reached the other end. The angles of elevation of the sun at those two times were 19 degrees and 68 degrees, respectively.

The engineering company charges UGX 50,000 per meter for the tarmacked pathway. Your neighbor has a budget of UGX 2,000,000 and wants to know if this amount will be sufficient for the project.

Tasks:

- (a) Help your neighbor determine the approximate length of the pathway to be tarmacked. The estimation should be accurate to one decimal place.
- (b) Advise him on the minimum amount of money he will need to spend on this project. Is his budget sufficient?

End