

KIYALA HIGH SCHOOL

MID-TERM ASSESSMENT TEST 2025

MATHEMATICS

S.4

Time: 2 Hours: 40mins

INSTRUCTIONS:

- The paper contains **four** items and two section A and B
- Section A is **compulsory**.
- Section B has two **parts I and II**, Attempt **only one** item from **each section**.
- Any **additional item** attempted **will not** be scored

Section A

Item 1

A company wishes to transport at least 480 parcels using a lorry and a van. A lorry can carry 60 parcels at a cost of 45,000 UG shs. Per trip. A van can carry 40 parcels at a cost of 30,000 UG shs. Per trip. There is 600,000 UG shs available for transport. The number of trips made by the lorry should not exceed 12. Those made by the van should not exceed twice the number of trips made by the lorry. If X and Y are the trips made by the lorry and van respectively.

Task

- a) Write down six inequalities representing the above information.
- b) Draw suitable graphs to show the feasible region.
- c) Find all the possible number of trips made by each vehicle so that the transport cost is minimized and find this minimum transport cost.

Item 2

Two friends, Sarah and Moses started a poultry to which they contributed shs. 4,000,000 and shs. 6,000,000 respectively. They agreed to share the profits in the ratio of 2:3 and the project started with 2,000 birds. After selling all the birds, they made a profit of 1,500,000 shs. They re-invested the profit in the project and the number of birds increased to 2,500. However, Moses was not sure of the amount he re-invested as well as the percentage increase in the number of birds.

On 1st march, 2024, they bought feeds and also balanced their book of accounts on that very day, they had a meeting in which they agreed to buy feeds after every 7 days and balance their books of accounts after every 15 days. However, Sarah wondered if there would be another date in the future on which they would buy feeds and balance their books of accounts on the same day.

Task

- How much of the profits did Moses re-invested in the business?
- What was the percentage increase in the number of birds?
- On what date in the future would they buy the feeds and also balance their books of accounts the same day.

Section B

Part 1: (Answer one item from this section)

Item 3

The geography department of your school is organizing a study tour of S.4 class. Basing on last year's complains due to poor feeling. The department has decided to interview students of this years to find out the number of students that would like to eat Matooke (M), posho (P) or rice (R). they came up with the following. 19 liked matooke, 24 liked posho, 25 liked rice, 3 liked matooke and rice only, 2 liked posho and rice only, 4 students disliked all the foods.

Task

Draw a plan to help the geography department to prepare meals for all the 55 students and use your plan to find how many consumed all the three food types.

Item 4

A farmer's cooperative society gave out fertilizer to a sample of maize farmers in the first season. The number of bags of maize harvested in the first season are given bellow.

20	40	60	55	36	69	59	78	47	66
59	70	53	24	63	50	46	38	68	57
30	65	58	61	57	86	77	54	29	88
62	44	89	45	87	65	47	49	52	69
41	80	37	56	74	27	76	58	79	39

The society wants;

- The data to be presented in a frequency distribution table with class of interval 10 for easy interpretation.
- To determine the number of bags of maize above which half of the farmers harvested so as to establish the real effects of the fertilizers.
- To determine the number of farmers whose harvest is 44.5 bags of maize and below for re-training before the second season but they lack the information.

Task

Help the society to;

- Represent the data in a frequency distribution table.
- Determine the number of bags of maize above which half of the farmers harvested.
- Determine the number of farmers for re-training.

Part II: (Answer one item from this section)

Item 5

A farmer in your village uses the formula below to calculate the amount of fertilizer required for planting crops. the formula used is $F = \frac{1}{2} \sqrt{\frac{R+A}{R-A}}$, where F is the amount of fertilizers in kilograms, A is the acre of land in square meters and R is the recommended amount of fertilizer per square meter in kilograms.

Additionally, the farmer wants to know how much area can be covered with a given amount of fertilizer and needs to rearrange the formula to make “A” the subject, then solve for the area when $R = 4$ and $F = 10$ kgs.

Task

Help the farmer by re-arranging the formula and calculating the area that can be covered for the given fertilizer amount.

Item 6

During the previously held National Population Census, one of the enumerators was sent to Kalangala district to carry out the exercise.

One day during the exercise, he had to travel from town ‘A’ to town ‘B’. these towns have a big island between them. Due to the poor topography of the place, the enumerator was disturbed with movements between the two towns.

Fortunately, one of the citizens of Kalangala advised the enumerator to first move to Kalangala S.S, from which he should proceed eastwards for some distance until he reaches the first trading centre and then branch off to the final destination.

Kalangala S.S is known to be 200km at the bearing of 150° from town ‘A’. the trading centre is 300km from the school, while town B is 400km away $N20^\circ E$ of the trading centre. However, due to increased degree of insecurity the body of National Bureau of Statistics employed two people who used to travel in an aeroplane monitoring the movement of the enumerators. One day, they observed two enumerators on the same side of the road walking out a distance of 25m between them viewed at angles of 60° and 40° respectively.

Task

- Assume that the island was not in place, help the enumerator to determine the distance (in km) of the shortest route between town ‘A’ and ‘B’
- If in the near future the government decides to construct a bridge linking Kalangala S.S and town ‘B’ what would be the length of the bridge?
- Based the calculation, determine the vertical distance between the plane and the ground at an instant when the enumerators were observed walking.

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