456/1

MATHEMATICS

Paper1

2025

$2\frac{1}{4}$hours

NTUNGAMO HIGH SCHOOL 2025.

Uganda Certificate of Education

S.4 New lower secondary curriculum

PRE REGISTRATION EXAM 2025

ASSESMENT EXAM

MATHEMATICS

Paper 1

2 Hours and 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.**
- **Graph paper** is provided.

SECTION: A

Answer all items in this section.

Item 1.

David is a poultry farmer in Ntungamo, he is to withdraw money from Centenary Bank amounting to **Shs.800,000** and this amount was divided in a ratio **5:3:2** for feeds, medication and water supply. He is supposed to pay back the money for feeds in three installments, **40%** in the first installment, $^{2}/_{5}$ of the remainder of money in the second installment and the rest in the third installment. He has been invited to attend a workshop without withdrawing the money. At the time when the money is needed he had not yet returned. He directed his wife to get the **ATM** card from the drawer wrapped in apaper with the secret number **43** in base ten. The actual pin is obtained by converting this number to base three.

David is supposed to buy feeds, but he discovers that he has feeds enough to feed **300** chickens for **20** days. He plans to buy 100 more chicken but he is not sure how long the same feeds will last.

Task:

Help David to determine;

(a) The amount of money available for Medication. **(20 scores)**
(b) How much he will pay for feeds in the third installment.
(c) The actual **PIN** the wife will use to withdrawal the money.
(d) The number of days the same feeds will last after buying more **100** chichens.

Solution.

Amount = Shs.800,000

Feeds:medication:watersupply = 5:3:2

Total ratio = 5+3+2 = 10 parts. I_1

(a) Medication = $^{3}/_{10} \times 800{,}000$ = Shs.240,000 I_1
M_1

Shs.240,000 is available for medication. AP_1

(b) Feeds = $^{5}/_{10} \times 800{,}000$ M_1

=Shs.400,000 I_1

1st installment.

$=^{40}/_{100} \times 400{,}000$ M_1

= Shs.160,000 I_1

Remainder.

= Shs.400,000 – Shs.160,000

= Shs.240,000 I_1

2nd installment.

$= \frac{2}{5} \times 240{,}000$ M_1

= Shs.96,000 I_1

3rd installment.

= 400,000 – (160,000 + 96,000)

Shs. 144,000 I_1

Allow any other possible method with a correct answer.

He will pay Shs.144,000 for fees in the last installment. AP_1

(c) 43_{ten} to base three.

÷	No	REM
3	43	1
3	14	2
3	4	1
	1	

M_1 M_1

$= 1121_{three}$ I_1

1121 is the actual pin the wife will use to withdrawal the money. AP_1

(d) 300 chickens can eat feeds in 20 days.

(300 + 100)

400 chickens can eat feeds in ?? days

Let the days be x.

300chickens × 20 chickens = 400chickens × xdays

6000 chicken days = 400x chicken days.

$X = \frac{6000}{400}$ M_1

X = 15 days I_1

The feeds will last for 15 days after buying more 100 chickens. AP_1

Item 2.

Kakembo is planning for a small birthday party for his son and wishes to spend Shs.98,000 to buy 5 kgs of meat and 7 kgs of rice. However, some guests that he had invited communicated that they would not make it to the party. There fore, he had to reduce both quantities by 2 kgs hence leading to a reduction in his expenditure by Shs.32,000.

When Kakembo went to the market, there was an 80% increase in the price of each kilogram of meat and an offer given to him on rice as 25% discount on each kg.

Task:

(a) Help Kakembo to estimate the price of meat and the rice per kilogram.

(b) What amount does he pay in order for the party to be a success? **(20 scores)**

Solution.

(a)

Meat	Rice	Cost
5kg	7kg	Shs.98,000
Reduction of 2kg,		Shs.32,000
3kg	5kg	Shs.66,000

M_1

Let the cost per kg of meat be m and that of rice be r.

$5m + 7r = 98{,}000$
$3m + 5r = 66{,}000$ M_1

$3 \mid 5m + 7r = 98000$ …….(i) M_1
$5 \mid 3m + 5r = 66{,}000$ …….(ii)

$15m + 21r = 294{,}000$
$-\ 15m + 25r = 330{,}000$ M_1
$0 - 4r = -36{,}000$

$\frac{-4r}{-4r} = \frac{-36{,}000}{-4}$ M_1

$r = Shs.9000$ I_1 AP_1

from ….(i)
$5m + 7(9000) = 98{,}000$ M_1
$5m + 63{,}000 = 98{,}000$

$m = \frac{98{,}000-63{,}000}{5}$ M_1

$m = Shs.7{,}000$ I_1

The price of meat per kg is Shs.7,000 and that of rice is Shs,9000. AP_1

(b) 80% increase in price of meat
Increase = 100% + 80% = 180% I_1

New price of meat = $^{180}/_{100} \times 7{,}000$ M_1

= Shs.12,600 I_1

25% discount on price of rice.

Decrease = 100% - 25% = 75%. I_1
New price of rice = $^{75}/_{100} \times 9{,}000$ M_1

= Shs.6,750 I_1

Amount = 3m + 5r
= (3×12,600) + (5×6750) M_1
= 37,800 + 33,750
Amount = Shs.71,550 I_1

He pays Shs.71,550 in order for the party to be a success. AP_1

20 Scores

SECTION B

This section has two parts I and II
Answer one item from each part

Part I

Item 3.

Kelan Supplies Limited, A company that supplies food stuffs supplied food items to three schools as follows;

First week;

- Jinja SS; 3 bags of posho, 1 bag of rice and 3 bags of cassava
- Jinja College; 2 bags of posho and 2 bags of rice.
- Jinja Modern SS College; 1 bag of posho, 2 bags of rice and 2 bags 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 Modern SS; 3 bags of posho and 1 bag of cassava

The price of posho, rice and cassava is Shs. 20,000, Shs. 30,000 and Shs. 10,000 per bag respectively.

After the two weeks, he wanted to improve his mode of supply, that is to say, supplying what is preferred more by the students in the schools. Therefore, 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 foodstuffs. 47 liked cassava (C), 53 liked posho, 23 liked posho only, 10 liked cassava only and 15 liked all the three food stuffs. Forty-five liked rice and 5 liked only rice.

Task:

(a) Arrange the amount of foodstuffs bought for each week and the prices using suitable arrays of rows and columns and use them to determine which school spent most in the first two weeks.

(b) (i) Arrange the results of a survey using a suitable statistical diagram.

(ii) Use it to determine the number of students that prefer at least two food stuffs.

(iii) How many students were randomly picked for this survey?

(iv) What is the chance that a student picked at random prefers rice? What conclusion can he draw from this value as per requirements of his survey?

(20 scores)

Solution.

(a) 1st week.

SCHOOL	POSHO	RICE	CASSAVA
Jinja S.S	3	1	3
Jinja college	2	2	0
Jinja modern S.S	1	2	2

M_1

2nd week.

1st week.

$$\begin{pmatrix} 3 & 1 & 3 \\ 2 & 2 & 0 \\ 1 & 2 & 2 \end{pmatrix}$$

I_1

SCHOOL	POSHO	RICE	CASSAVA
Jinja S.S	3	0	2
Jinja college	1	2	1
Jinja modern S.S	3	0	1

2^{nd} week $\begin{pmatrix}3 & 0 & 2\\ 1 & 2 & 1\\ 3 & 0 & 1\end{pmatrix}$ I_1 Cost $\begin{pmatrix}20,000\\ 30,000\\ 10,000\end{pmatrix}$ I_1

Expenses for first week.

$$\begin{pmatrix}3 & 1 & 3\\ 2 & 2 & 0\\ 1 & 2 & 2\end{pmatrix}\begin{pmatrix}20,000\\ 30,000\\ 10,000\end{pmatrix} = \begin{pmatrix}60,000+30,000+30,000\\ 40,000+60,000+0\\ 20,000+60,000+20,000\end{pmatrix} = \begin{pmatrix}120,000\\ 100,000\\ 100,000\end{pmatrix}$$ M_1 I_1

Expenses for second week.

$$\begin{pmatrix}3 & 0 & 2\\ 1 & 2 & 1\\ 3 & 0 & 1\end{pmatrix}\begin{pmatrix}20,000\\ 30,000\\ 10,000\end{pmatrix} = \begin{pmatrix}60,000+0+20,000\\ 20,000+60,000+10,000\\ 60,000+0+10,000\end{pmatrix} = \begin{pmatrix}80,000\\ 90,000\\ 70,000\end{pmatrix}$$ M_1 I_1

$$\text{TotaL} = \begin{pmatrix}120,000\\ 100,000\\ 100,000\end{pmatrix} + \begin{pmatrix}80,000\\ 90,000\\ 70,000\end{pmatrix} = \begin{pmatrix}200,000\\ 190,000\\ 170,000\end{pmatrix}$$ I_1

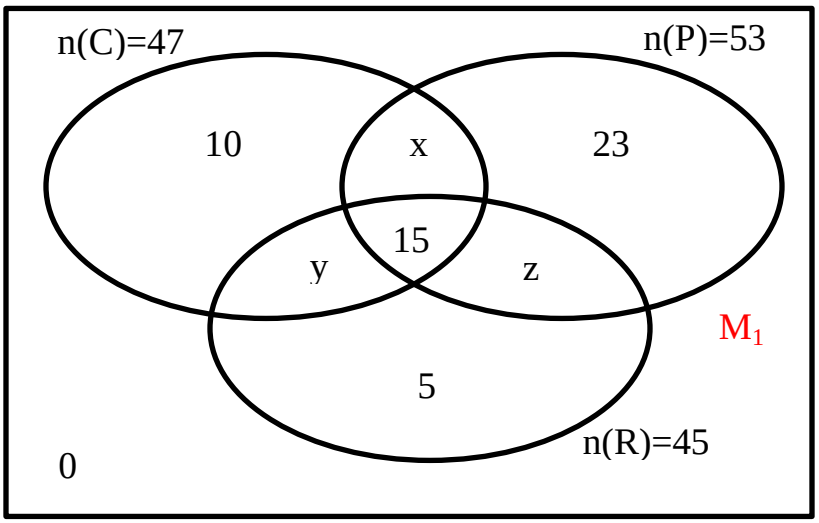
Jinja S.S spent the most amount of Shs.200,000 in the first two weeks. AP_1

(b) Let Cassava be **C**, Posho be **P** and Rice be **R**.

n(C) = 47
n(P) = 53
n(P) only = 23
n(C) only = 10

n(CnPnR) = 15
n(R) = 45
n(R) only = 5.

(i) A venn diagram showing students who liked Cassava, Posho and Rice.



M_1

Let
n(CnP) only be x,
n(CnR) only be y
and
n(PnR) only be z.

$10+x+15+y = 47$

$25+x+y = 47$

$x+y = 22$ ….(i)

$x+z+15+23 = 53$

$x+z+38 = 53$

$x+z = 15$ ….(ii)

$y+z+15+5 = 45$

$y+z+20 = 45$

$y+z = 25$ ….(iii)

From …..(i)

$x = (22 - y)$ ….(iv)

(iv) into (ii)

$22 - y + z = 15$

$z - y = -7$ …..(v)

solving (v) and (iii)

$z - y = -7$

$+ \quad z + y = 25$

$2z + 0 = 18$

$z = \frac{18}{2}$

$z = 9$ students. I_1

From …(iii)

$y+9 = 25$

$y = 25 - 9$

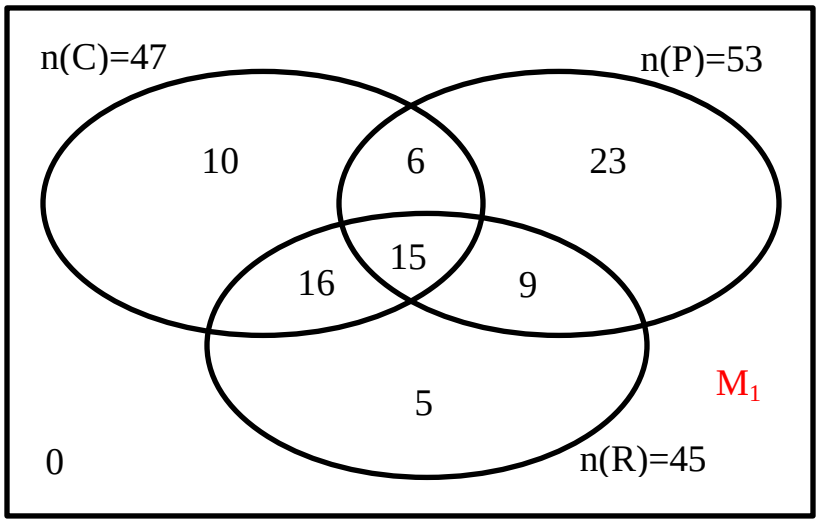
$y = 16$ students. I_1

from …..(iv)

$x = 22 - y$

$x = 22 - 16$

$x = 6$ students. I_1



M_1

(ii) Atleast two foodstuffs.

$= 6+9+16+15$

$= 46$ students. I_1

46 students prefer atleast two foodstuffs. AP_1

(iii) $n(€) = 10+23+5+6+9+16+15$

$= 84$ students. I_1

84 students were picked for the survey. AP_1

(iv) Chance/Probability = $\frac{n(E)}{n(S.S)}$

Chance = $\frac{45}{84}$ I_1

More than half (50%) of the students like rice. AP_1

20 Scores.

Item 4.

A teacher has given a test to his class and the scores are shown below.

64	58	52	73	62	50	60	64	60	42
58	45	58	74	66	73	48	46	55	52
48	54	73	61	58	50	51	69	59	44
41	54	46	43	61	67	70	49	47	53

The teacher would like to;

- Present the data in a frequency distribution table using class interval of 5.
- Find the average mark of the students in that test.
- Determine the number of students who will write commitment letters if they score below 54.5 .
- Determine the score that is half- way the distribution.

Task:

Help the teacher to;

(a) Present the data in a frequency distribution table.
(b) Find the average mark of the students in that test.
(c) Determine the number of students who will write commitment letters.
(d) Determine the score that is half –way the distribution. **(20 scores)**

Solution.

(a)

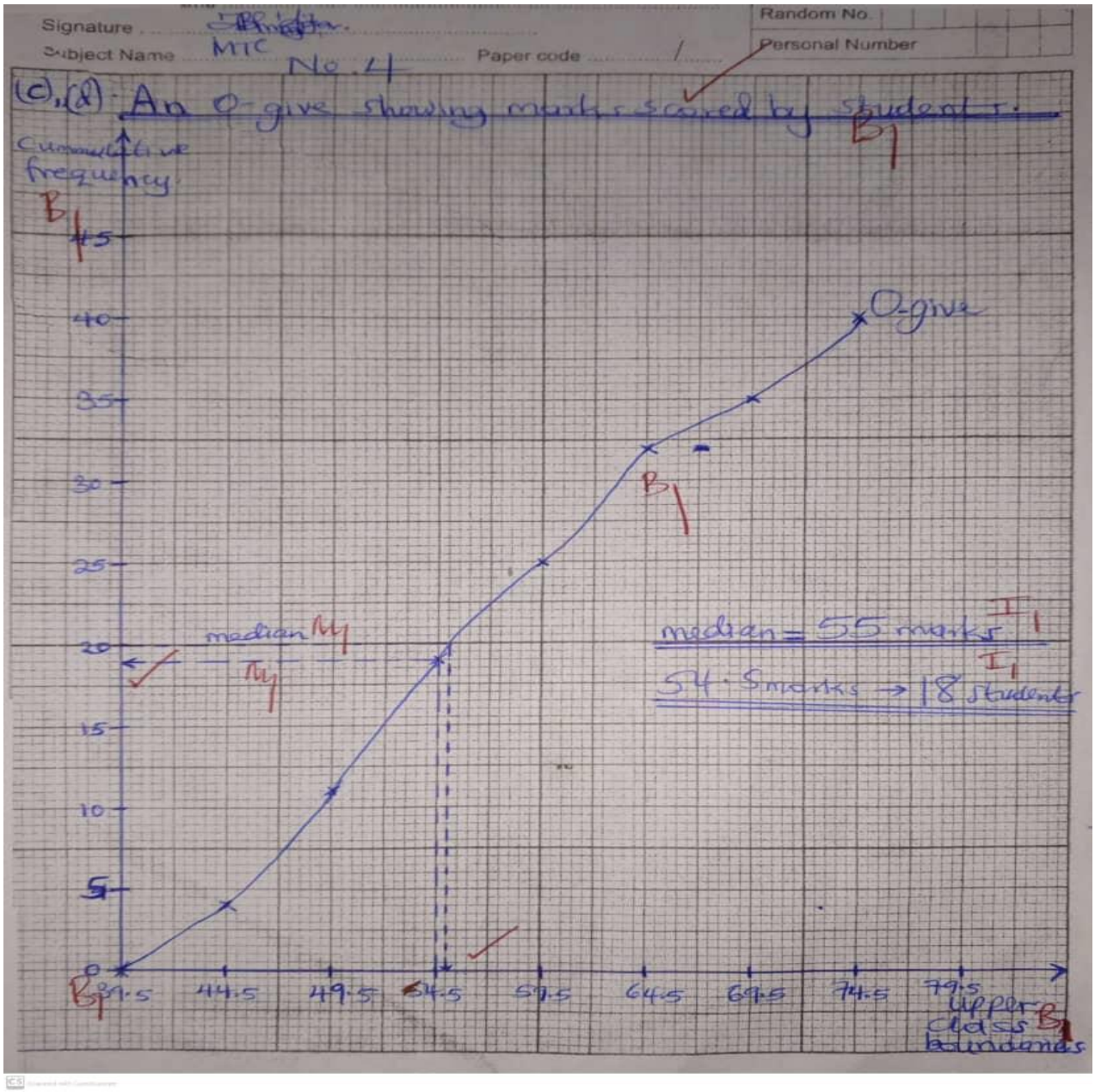
Marks	*Tally*	F	Cf	Mid Point	fx	Class boundaries
40 – 44	~~*IIII*~~	4	4	42	168	39.5 – 44.5
45 – 49	~~*IIII*~~ *II*	7	11	47	329	44.5 – 49.5
50 – 54	~~*IIII*~~ *III*	8	19	52	416	49.5 – 54.5
55 – 59	~~*IIII*~~ *I*	6	25	57	342	54.5 – 59.5
60 – 64	~~*IIII*~~ *II*	7	32	62	434	59.5 – 64.5
65 – 69	*III*	3	35	67	201	64.5 – 69.5
70 - 74	~~*IIII*~~	5	40	72	360	69.5 – 74.5

I_1 I_1 I_1 I_1 I_1

$\sum f = 40$ $\sum fx = 2250$

(b) Average $= \frac{\sum fx}{\sum f} = \frac{2250}{40} =$ 56.25 marks. M_1 I_1

The average mark of the students is 56.25 AP_1



(c) 18 students will write commitment letters. ***(from the graph paper)*** AP_1

(d) 55marks is the score that is half-way the distribution. AP_1

OR; Median = $L_m + \left(\frac{N/2 - cfb}{fm}\right)c_w = 54.5 + \left(\frac{40/2 - 19}{6}\right)5$ M_1 M_1 = 55.33333marks I_1

55.3333 marks is the score that is half-way the distribution. AP_1

Graph is the best method for this question on finding the median which is trhe score that is half-way of the distribution.

Part II

Answer one item from this part

Item 5.

A friend to your guardian wants to bring his child to the same school you attend. He calls your guardian and requests her to direct him to your school. There are two routes you can use from home to school.

Route A: A straigt direct murram roads from home to school.

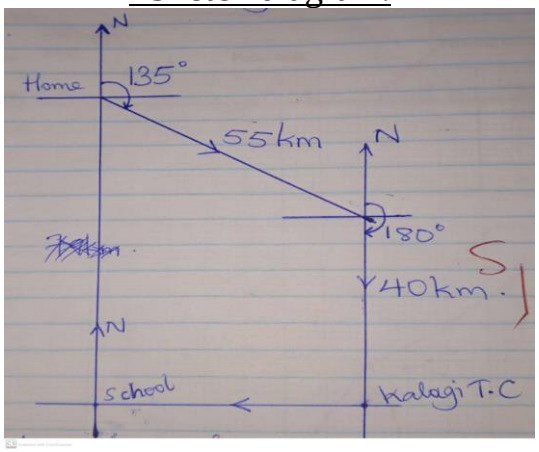
Route B: From home, drive in the direction 135 degrees for 55km and then makes a bearing of 180 degrees turn and drive more 40 km you will find Kalagi trading centre. From Kalagi you will further drive in the western direction until you reach the school. The home is located vertically above the school premises.

The friend requests your guardian to send him a drawing instead summarizing his direction but she assigns you to draw.

Task:

(a) Assist her to make a drawing showing the roadmap to school.
(b) If after the drawing a friend rather decides to take the Southern direction from home. Through what distance will he drive to reach school?
(c) If he starts driving at 12:30pm and arrives at school at 2:30pm through route B non-stop. What shall be his average spoeed?
(d) Which option of the routes should you take and why? **(20 scores)**

(a) Solution. Sketch diagram.



(b) Using scale of;

1cm : 5km

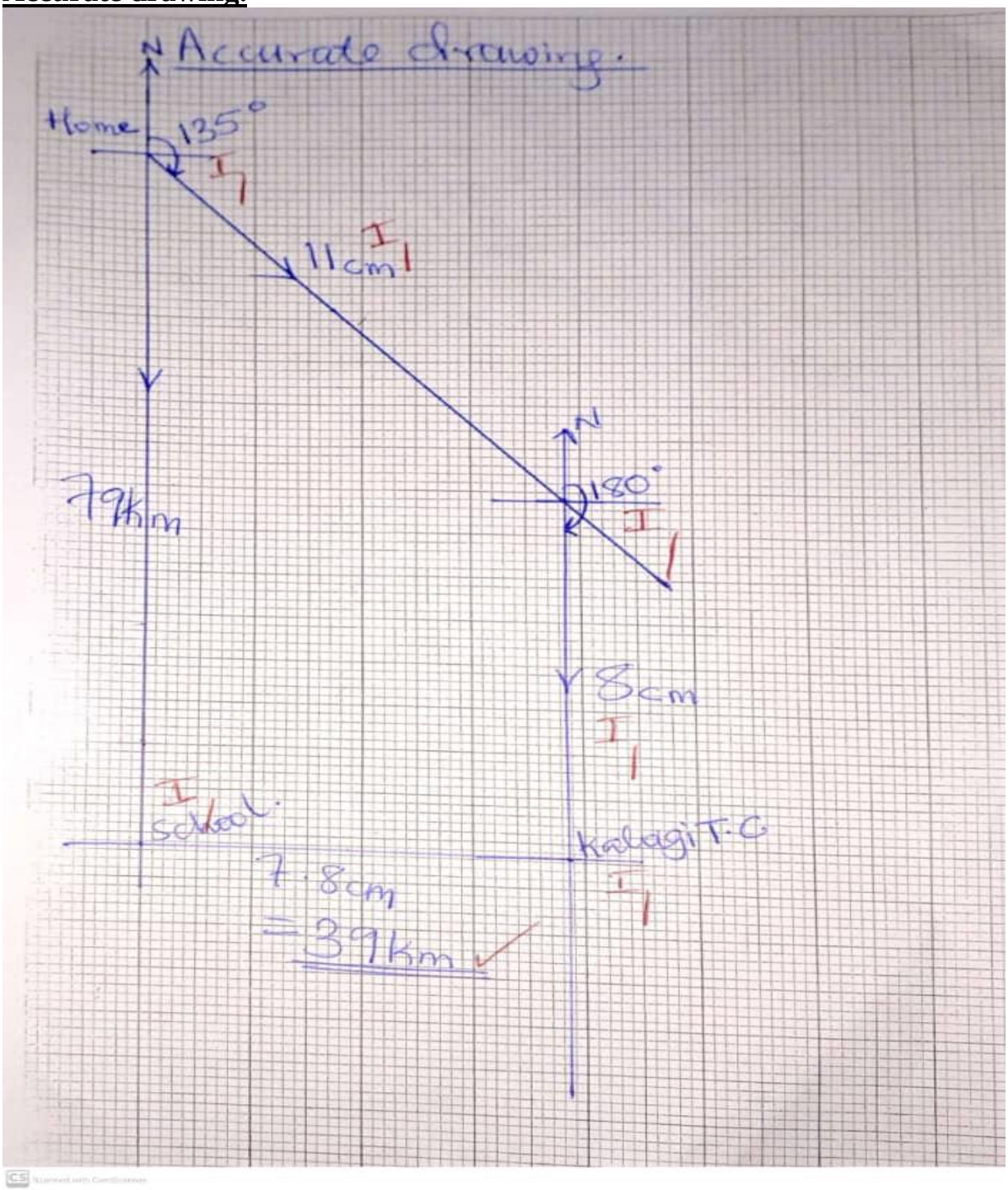
55km = $\left(\frac{55}{5}\right)$ cm

= 11 cm $^{1}/_{2}$

40km = $\left(\frac{40}{5}\right)$ cm

= 8 cm $^{1}/_{2}$

Accurate drawing.



15.80 cm I_1

1cm = 5km

15.80 cm = 15.80 × 5 M_1

= 79 km. I_1 +,- 1 km ***(78 – 80) km***.

The driver will reach school through 79 km. AP_1

(c) Average speed = $\frac{T.D.C}{T.T.T}$

T.D.C = (55+40+(7.8×5)) M_1 = 134 km. I_1

T.T.T = ??

0230hrs + 1200hrs =1430hrs.

1230hrs + 0000hrs = 1230hrs } M_1

Duration 1430hrs – 1230hrs = 0200hrs .

T.T.T = 2hrs. I_1

Average speed = $\frac{134}{2}$ M_1

Average speed = 67km/hr. I_1

67 km/hr shall be his average speed. AP_1

(d) I should take route A,

Because it covers a shorter distance hence less time to come from the same place (Home) to a similar place (School) as compared to route B. AP_1

20 Scores.

Item 6.

Your Aunt is a senior lawyer employed by a certain law farm. She saved her money and used it to buy a car in January 2022 from her friend at **Ugx 12,500,000.** The car depreciated at a rate of **10%** per annum. In January 2025 she went to the bond to sell it and top up the money and buy a brand new car but she didn't know the value of the car at the time.

At the bond a brand new car of her preference goes for twenty five million but the manager told her they have two payment optiopns.

First Option: Buy the car by paying cash and receive a discount of **8%** of the cash value.

Second Option: Deposit **60%** of the cash value and later pay five million per month for **3** months.

Task:

Help your aunt to determine;

(a) The value of her car in January 2025.

(b) The amount she will pay if she buys the car by paying cash.
(c) The saving she would make if she bought the car by paying cash rather than paying in installments.
(d) How much more money does she need to top on the value of the old car to accomplish the deposit of the new car under the second option of payment.

(20 scores)

Solution.

Buying price (Principal) = Ugx.12,500,000

r = 10%, By January 2025, n = 3 years I_1

(a) Depreciation $A = P(1 - {}^{r}/_{n})^{n}$

$A = 12{,}500{,}000(1 - {}^{10}/_{100})^{3}$ M_1

$A = 12{,}500{,}000(0.9)^{3}$

A = Ugx.9,112,500 I_1

The value of the car will be Ugx.9,112,500 by January 2025. AP_1

(b) 100% - 8% = 92% I_1

Amount to pay by paying cash.

$= {}^{92}/_{100} \times 25{,}000{,}000$ M_1

= Ugx.23,000,000 I_1

She will pay Ugx.23,000,000 if she buys the car by paying cash. AP_1

(c) Deposit = $ {}^{60}/_{100} \times 25{,}000{,}000$ M_1

= Ugx.15,000,000 I_1

Total amount for 2nd option.

= Ugx.15,000,000 + Ugx.15,000,000 M_1

= Ugx.30,000,000 I_1

Total amount for installments. M_1

5,000,000×3 = Ugx.15,000,000 I_1

Saving (Difference).

Ugx.30,000,000 – Ugx.23,000,000 M_1

=Ugx.7,000,000 I_1

She would save Ugx.7,000,000 by paying cash rather than paying in installments. AP_1

(d) Difference = Shs.15,000,0000 –Shs.9,112,500 M_1

= Shs.5,887,500 I_1

She needs Shs.5,887,500 more money to top on the value of the old car to accomplish the deposit of the new car under the second payment optiom. AP_1

20 Scores.

END

Compiled by Tr.Bakashaba Edgar. (0787129749)

NTUGAMO HIGH SCHOOL MTC Department.