UGANDA NATIONAL EXAMINATIONS BOARD

PRIMARY LEAVING EXAMINATION

2023

MATHEMATICS

Time Allowed: 2 hours 30 minutes

Random No.						Personal No.		

Candidate's Name: TR.FAUSTINE

Candidate's Signature: 0789452535 / 0754 607445

District ID No.

Read the following instructions carefully:

1. Do not write your **school** or **district name** anywhere on this paper.
2. This paper has **two** sections: **A** and **B**. Section **A** has **20** questions and section **B** has **12** questions. The paper has **15 printed pages**.
3. Answer **all** the questions. **All** the working for both sections **A** and **B** must be shown in the spaces provided.
4. **All** the working **must** be done using a **blue** or **black** ball point pen or ink. Any work done in pencil other than graphs and diagrams will **not** be marked.
5. **No calculators** are allowed in the examination room.
6. Unnecessary **changes** in your work and handwriting that cannot be read easily may lead to **loss of marks.**
7. Do not fill anything in the table indicated: **"FOR EXAMINERS' USE ONLY"** and boxes inside the question paper.

FOR EXAMINERS' USE ONLY		
QN. NO.	**MARKS**	**EXR'S NO.**
1 - 5		
6 - 10		
11 - 15		
16 - 20		
21 - 22		
23 - 24		
25 - 26		
27 - 28		
29 - 30		
31 - 32		
TOTAL		

Turn Over

SECTION A: 40 MARKS

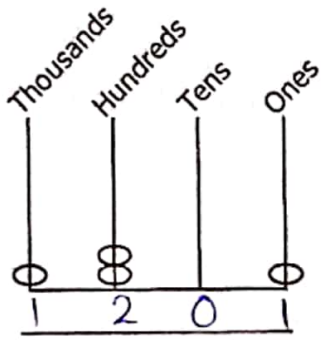
*Answer **all** the questions in this section.*

*Questions **1** to **20** carry two marks each.*

1. Work out: 63 + 54

$$\begin{array}{r} 63 \\ +\ 54 \\ \hline 117 \end{array}$$

2. Write the base ten number shown on the abacus below.



1201_{ten}

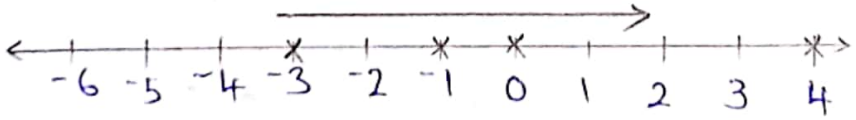
3. Given that R = {a, b, c, d} and S = {a, f, p, s}, find n(R∪S).

$R \cup S = \{a, b, c, d, f, p, s\}$

$n(R \cup S) = 7$

$n(R \cup S) = 7$

4. Arrange the integers -3, 4, 0 and -1 in ascending order.



$-3, -1, 0, 4$

A training for scouts started on a Wednesday and took 30 days. Find the day of the week on which the training ended.

Day given + No. of days = - (finite 7)
3 + 30 = - (finite 7)
33 ÷ 7 = - (finite 7)
4 rem 5 = - (finite 7)
= 5 (finite 7)

∴ The training ended on Friday

6. Change 750 millilitres into litres.

1000 ml = 1 l
750 ml = $\left(\frac{750}{1000}\right)$ l
= $\left(\frac{75}{100}\right)$ l

= 0.75 litres

7. Find the value of $4^2 + 3^2 \times 9^\circ$.

$4^2 + 3^2 \times 9^\circ$
$(4 \times 4) + (3 \times 3) \times 9^\circ$
$16 + 9 \times 1$
$16 + 9$

25

8. A meeting that took 2 hours and 15 minutes ended at 1:20 p.m. At what time did the meeting begin?

Ending time in 24 hour clock

Hours	Minutes
1	20
+12	00
13	20

1320 hours

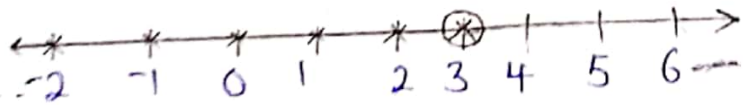
S.T = E.T - D

Hours	Minutes
13	20
- 2	15
11	05

P.O.W
1
2 10
- 15
05

∴ The meeting began at 11:05 a.m

9. Write the solution set for the inequality $P \leq 3$.



~~P: P = {3, 4, 5, 6, ...}~~

P: P = {3, 2, 1, 0, -1, -2, ...}

10. Find the next number in the sequence:

1, 8, 27, 64, 125

1^3 2^3 3^3 4^3 $5^3 = 5 \times 5 \times 5$

$= 25 \times 5$

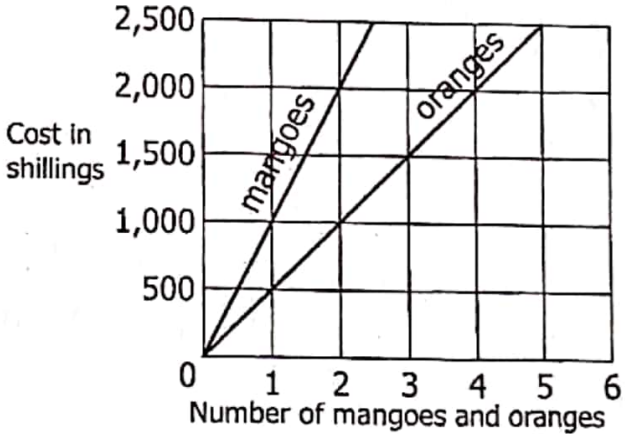
$= 125$

11. Change 14_{ten} to base three.

Base	No.	Rem
3	14	2
3	4	1
3	1	1
	0	

$\therefore 14_{ten} = 112_{three}$

12. The graph below shows the cost in shillings of mangoes and oranges. Study the graph and use it to answer the question that follows.



Find the total cost of 2 mangoes and 3 oranges.

Sh. 2,000
+Sh. 1,500
Sh. 3,500

13. Given that 78t is a three-digit number which is divisible by 9, find the digit represented by t.

~~$M_3 = \{3, 6, 9, 12, 15, 18, 21, 24, \ldots\}$~~

$M_9 = \{9, (18), 27, 36, 45, \ldots\}$

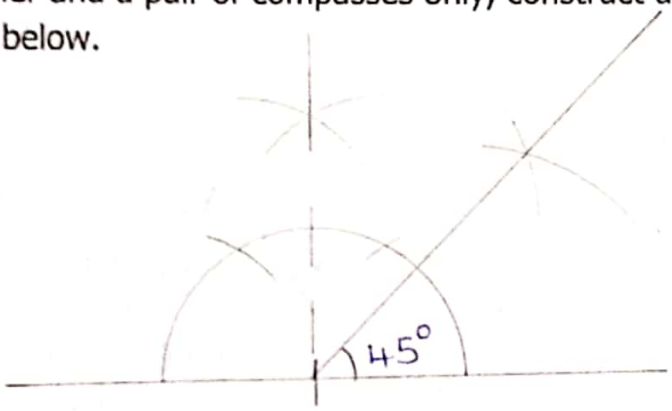
$7 + 8 + t = 18$

$15 + t = 18$

$15 - 15 + t = 18 - 15$

$t = 3$

14. Using a ruler and a pair of compasses only, construct an angle of 45° in the space below.



15. Simplify: $5q - 2r - 3q - r$.

$5q - 3q - 2r - r$

$2q - 3r$

16. A farmer sold the following number of eggs in a period of three days; 62, 73 and 78. Calculate the average number of eggs the farmer sold in that period.

$\text{Average} = \frac{\text{Sum of data}}{\text{No. of data}}$

$= \left(\frac{62 + 73 + 78}{3}\right)$ eggs

$= \left(\frac{213}{3_1}\right)$ eggs

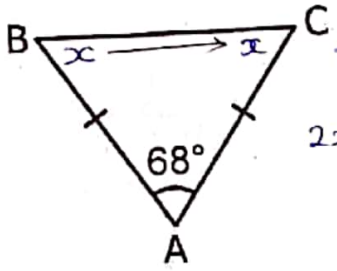
$= 71$ eggs

17. A businessman bought a watch at sh 45,000. He sold it and made a loss of sh 1,500. Find his selling price.

S.P = B.P − LOSS

Sh. 45,000
− Sh. 1,500
Sh. 43,500

18. In the diagram below, calculate the size of angle ABC.



$180^\circ - 68^\circ = 112^\circ$

Let $\angle ABC$ be x

$x + x + 68^\circ = 180^\circ$
$2x + 68^\circ = 180^\circ$
$2x + 68^\circ - 68^\circ = 180^\circ - 68^\circ$
$2x = 112^\circ$
$\frac{2x}{2} = \frac{112^\circ}{2}$
$x = 56^\circ$

$\therefore \angle ABC = 56^\circ$

19. In one hour, the minute hand of a clock covers 88 cm. Calculate the length of the minute hand. (Use $\pi = \frac{22}{7}$)

Length of minute hand represents radius

$2\pi r = C$
$2 \times \frac{22}{7} \times r = 88\text{cm}$
$\frac{1}{7} \times \frac{44r}{7} = 88\text{cm} \times 7$
$\frac{44r}{44} = \frac{88\text{cm} \times 7}{44}$
$r = 14\text{cm}$

∴ The minute hand is 14 cm long.

20. A pupil scored $\frac{20}{25}$ in the first term Mathematics test and $\frac{18}{20}$ in the second term Mathematics test. In which test did the pupil perform better?

First term	Second term
$\frac{20}{25} \times \frac{4}{100}$	$\frac{18}{20} \times \frac{5}{100}$
80	90
80 marks	90 marks

In Second term's test

2	25	20
2	25	10
5	25	5
5	5	1
	1	1

$2 \times 2 \times 5 \times 5$

4×25

LCM = 100

SECTION B: 60 MARKS

*Answer **all** the questions in this section.*

Marks for each question are indicated in brackets.

21. (a) Simplify: $\frac{1}{2} - \frac{1}{4} \div \frac{4}{5}$ BODMAS ✓ ✓ *(03 marks)*

$\frac{1}{2} - \frac{1}{4} \div \frac{4}{5}$

$\frac{1}{2} - \frac{1}{4} \times \frac{5}{4}$

$\frac{1}{2} - \frac{5}{16}$

$\frac{(\frac{1}{2} \times \frac{8}{16}) - (\frac{5}{16} \times \frac{1}{16})}{16}$

$\frac{8 - 5}{16}$

$\frac{3}{16}$

(b) Work out: $\frac{0.27 \times 1.2}{0.9}$ *(02 marks)*

$\left(\frac{27}{100} \times \frac{12}{10}\right) \div \frac{9}{10}$

$\frac{3}{27} \times \frac{12}{10} \times \frac{10}{9_1}$

$\frac{36}{100}$

0.36

22. An athlete covered 400 metres in 48 seconds. Calculate the speed of the athlete in kilometres per hour. *(04 marks)*

Speed $= \frac{D}{T}$

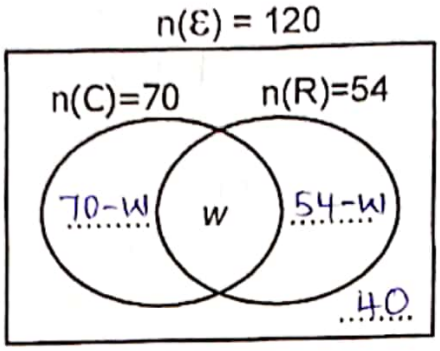
$= \frac{400\,km}{1000} \div \frac{48\,h}{3600}$

$= \frac{400\,km}{1000} \times \frac{3600}{48\,h}$

$= 30\,km/h$

23. A total of 120 guests were invited for a marriage ceremony. 70 guests attended the church service (C), 54 guests attended the reception (R) and w guests attended both the church service and the reception. 40 guests did not turn up for the marriage ceremony.

(a) Use the given information to complete the Venn diagram below. *(03 marks)*



(b) Calculate the number of guests who attended both the church service and reception. *(02 marks)*

$70+54+40-w = 120$

$164 - w = 120$

$164-164-w = 120-164$

$\frac{-w}{-1} = \frac{-44}{-1}$

$w = 44$

44 guests attended both church service and reception.

24. In a certain school, there are 126, 90 and 72 pupils in Primary Five, Six and Seven respectively. In each class, groups with equal number of pupils were formed.

(a) Find the largest number of pupils in each group. *(03 marks)*

GCF of 126, 90, 72

2	126	90	72
3	63	45	36
3	21	15	12
	7	5	4

$(2 \times 3 \times 3)$ pupils

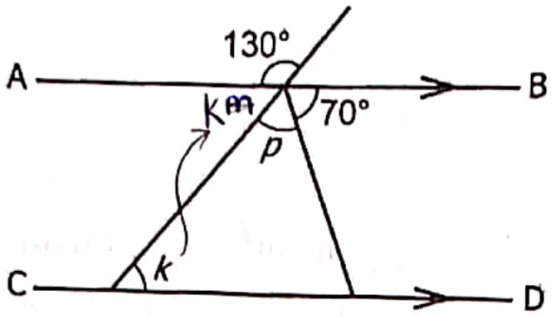
18 pupils

(b) How many groups were formed in Primary Five? *(02 marks)*

$\left(\frac{126}{18}\right)$ groups

7 groups

25. In the diagram below, line AB is parallel to line CD. Study the diagra and use it to answer the questions that follow.



Find the size of;

(a) angle p. *(02 marks*

$p + 70^\circ = 130^\circ$ (vertically opposite ∠s)

$p + 70^\circ - 70^\circ = 130^\circ - 70^\circ$

$p = 60^\circ$

(b) angle k. *(02 marks*

$k + p + 70^\circ = 180^\circ$ (co-int. ∠s)

$k + 60^\circ + 70^\circ = 180^\circ$

$k + 130^\circ = 180^\circ$

$k + 130^\circ - 130^\circ = 180^\circ - 130^\circ$

$k = 50^\circ$

OR

$k + 130^\circ = 180^\circ$

$k + 130^\circ - 130^\circ = 180^\circ - 130^\circ$

$k = 50^\circ$

26. A carton of salt contains 40 packets. Each packet has a mass of 250 grammes.

(a) Work out the mass in Kilogrammes, of all the packets of salt in the carton. *(02 marks)*

1 packet → 250g

40 packets → (250 × 40)g

= 10,000g

1000g = 1kg

10000g = $\left(\frac{10000}{1000}\right)$ kg

= 10kg

(b) A family uses a packet of salt every 5 days. Find the number of days the carton will last the family. *(02 marks)*

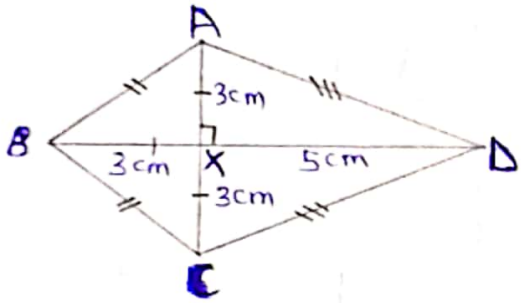
1 packet → 5 days

40 packets → (40×5) days

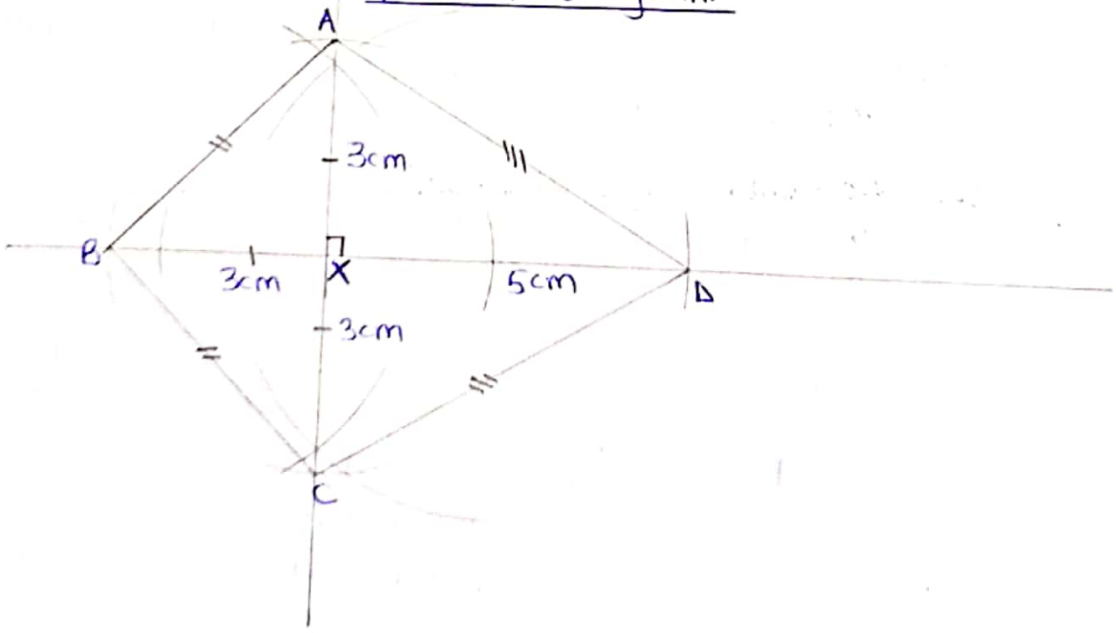
200 days.

27. Using a ruler and a pair of compasses only, construct a kite ABCD in which diagonal AC = 6 cm. Diagonal BD bisects AC at X such that BX = 3 cm and DX = 5 cm. *(05 marks).*

Sketch



Accurate diagram



28. A man is four times as old as his daughter. Six years ago, the sum of their age was 48 years.

Find;

(a) the age of the daughter now. *(03 marks)*

Let the daughter's age be k

Time	daughter	A man	Sum
Now	k	4k	?
6years ago	k-6	4k-6	48yrs

k-6yrs + 4k-6yrs = 48 years
5k-12 years = 48years
5k-12 years+12years = 48years +12years
5k = 60years

$\frac{5k}{5} = \frac{60}{5}$ years
k = 12years

The daughter is 12 years old now

(b) the age of the man six years ago. *(02 marks)*

(4k-6)years
(4xk-6)years
(4x12-6)years
(48-6)years

42years

29. A bank bought and sold foreign currencies in Uganda shillings (Ug.sh) on a certain day as shown in the table below. Study the table and use it to answer the questions that follow.

Currency	Buying in Ug.sh	Selling in Ug.sh
1 Kenya shilling (Ksh)	24	26
1 US dollar ($)	3,900	3,950
1 Great Britain pound (£)	4,400	4,700

(a) A tourist had £600 and exchanged them for Uganda shillings. Find the amount of money in Uganda shillings the tourist got. *(02 marks)*

£1 → Ugsh. 4,400
£600 → Ugsh. 4400x600
Ugsh. 2,640,000

(b) Moses had US dollars 200 to exchange for Kenya shillings. Find the amount of money in Kenya shillings he got from the bank. *(04 marks)*

1 US dollar → Ugsh. 3900

200 US dollars → Ugsh. 3900 × 200

Ugsh. 780,000

Ugsh. 26 → Ksh. 1

Ugsh. 780,000 → Ksh. $\left(\frac{780,000}{26_1}\right)$

Ksh. 30,000

30. A farmer employed two workers to dig a piece of land. The first worker could dig the land alone in 6 days. The second worker could dig the same piece of land alone in 3 days. The two workers dug the land together.

(a) Find the number of days they took to dig the piece of land. *(04 marks)*

Duration = $\frac{\text{Product}}{\text{Sum}}$

$= \left(\frac{6 \times 3}{6+3}\right)$ days

$= \left(\frac{{}^{2}\cancel{18}}{\cancel{9}_{1}}\right)$ days

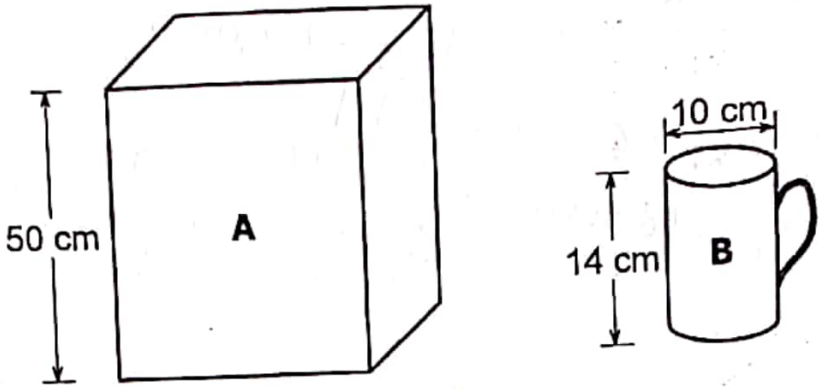
= 2 days

∴ They took 2 days

(b) The farmer paid each worker sh 15,000 per day. Calculate the amount of money the farmer spent to dig the piece of land. *(02 marks)*

1 day	2 days
1 worker → Sh. 15,000	Sh. 30,000
2 workers → Sh. 15000 × 2	× 2
Sh. 30,000	Sh. 60,000

31. Forty full cups of water in cup **B** fill container **A**. Study the diagrams and answer the questions that follow.



(a) Find the volume of cup **B**. (Use $\pi = \frac{22}{7}$) *(02 marks)*

Volume $= \pi r^2 h$

$= \frac{22}{7} \times 10\text{cm} \times 10\text{cm} \times 14\text{cm}$

$= 1100\ \text{cm}^3$

(b) Calculate the base area of container **A**. *(03 marks)*

base area $= \frac{\text{Volume of A}}{\text{height of A}}$

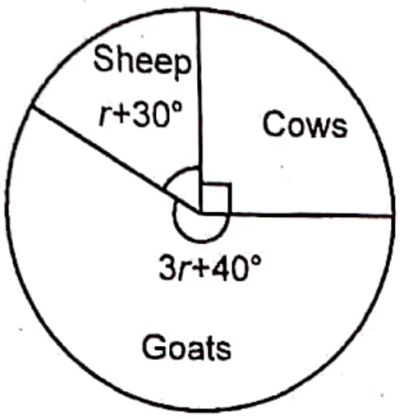
$= \frac{1100\ \text{cm}^3 \times 40}{50\text{cm}}$

$= \frac{880\ \text{cm}^2 \times 40}{50}$

$= 22\text{cm}^2 \times 40$

base area $= 880\text{cm}^2$

32. The pie chart below represents the number of animals reared on Amanya's farm. Study the pie chart and use it to answer the questions that follow.



(a) Find the value of r. *(02 marks)*

$r + 30° + 3r + 40° + 90° = 360°$

$4r + 160° = 360°$

$4r + 160° - 160° = 360° - 160°$

$4r = 200°$

$\frac{4r}{4_1} = \frac{200^{50}}{4_1}$

$r = 50°$

(b) Given that there are 11 more goats than sheep on the farm, calculate the total number of animals on the farm. *(04 marks)*

Goat's sector	Sheep's sector	Difference	Total no. of animals
$3r + 40°$	$r + 30°$	$190°$	$(11 \div \frac{110°}{360°})$ animals
$3 \times r + 40°$	$50° + 30°$	$- 80°$	$(11 \times \frac{360^{1}\cancel{0}^{\cancel{0}}}{11\cancel{0}^{\cancel{0}}_{1}})$ animals
$3 \times 50° + 40°$	$80°$	$110°$	
$150° + 40°$			36 animals
$190°$			

END