UGANDA NATIONAL EXAMINATIONS BOARD

PRIMARY LEAVING EXAMINATION

2024

MATHEMATICS

Time Allowed: 2 hours 30 minutes

Random No.						Personal No.		

Candidate's Name: TR. ISAAC ACOL

Candidate's Signature: Tel- 0778068380 | 0758262422

District ID No. | | | | |

FOR WHATSAPP & OTHER BUSINESSES

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 in the 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:

$$\begin{array}{r} {}^{1} \\ 35 \\ \times\ 3 \\ \hline 105 \end{array}$$

$3 \times 5 = 15$
$3 \times 3 = 9 + 1$
$= 10$

2. Write CXIV in Hindu Arabic numerals.

$CXIV = C \times IV$
$\downarrow \quad \downarrow \quad \downarrow$
$100 + 10 + 4$
$\therefore CXIV = 100 + 10 + 4$
$= 114$

OR

$C = 100$
$X = 10$
$IV = + 4$
$CXIV = 114$

3. Given that M = {b, a, t}, write down all the subsets of set M.

$\{\}, \{b\}, \{a\}, \{t\}, \{b,a\}, \{b,t\}, \{a,t\}, \{b,a,t\}$

4. Find a fraction equivalent to $\frac{4}{7}$.

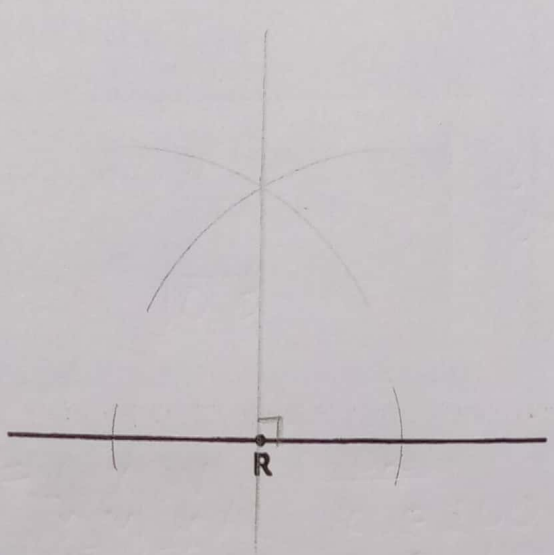
$\frac{4}{7} = \frac{4 \times 2}{7 \quad 2}$
$\frac{4}{7} = \frac{4 \times 2}{7 \times 2}$
$\frac{4}{7} = \frac{8}{14}$

5. Expand 3405 using powers of ten.

10^3	10^2	10^1	10^0
3	4	0	5

$(3 \times 10^3) + (4 \times 10^2) + (0 \times 10^1) + (5 \times 10^0)$

6. Using a ruler and a pair of compasses only, construct a right angle at point **R**.



7. Given that $a = 3$, $b = 1$ and n = 2, find the value of $2a^n b$.

$2a^n b = 2 \times a^n \times b$
$= 2 \times 3^2 \times 1$
$= (2 \times 3) \times (3 \times 1)$
$= 6 \times 3$
$\therefore 2a^n b = 18$

8. Find the next number in the sequence:

2, 3, 6, 11, 18, ... 27 .....

2, 3, 6, 11, 18, 27
+1 +3 +5 +7 +9
9+18
27

9. It takes Ankunda 35 minutes to walk from school to home. If she arrived home at 12:20 p.m, what time did she leave school?

H	Mins
~~12~~ 11	~~20~~ 80
−00	35
11	45

80 − 35
= 45

She left school at 11:45 a.m

10. Otunu sold a goat and made a profit of sh 18,000. The cost price of the goat was sh 90,000. Calculate Otunu's percentage profit.

percentage profit $= \left(\frac{\text{Profit}}{\text{Cost price}} \times 100\right)\%$

$= \left(\frac{\text{sh } 18{,}000}{\text{sh } 90{,}000} \times 100\right)\%$

$= (2 \times 10)\%$

$= 20\%$

11. Find the largest number that divides both 24 and 18 without a remainder.

2	24	18
3	12	9
	4	3

$= 2 \times 3$

$= 6$

12. Work out: $42 - 21 + 3$

$42 - (21 \div 3)$

$= 42 - 7$

$= 35$

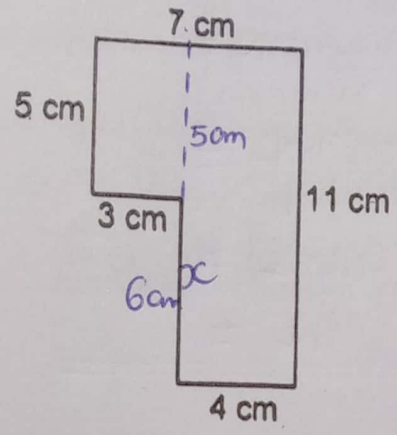
13. The range of a set of scores is 23. The highest score is 76. Find the lowest score.

Lowest score = Highest score − Range

Lowest score = 76 − 23

Lowest score = 53

14. Find the perimeter of the figure below.



$x = 11cm - 5cm$

$x = 6cm$

$P = 4cm + 11cm + 7cm + 5cm + 3cm + 6cm$

$P = 15cm + 12cm + 9cm$

$P = 27cm + 9cm$

$P = 36cm$

15. A school cook requires 24 kg of maize flour to feed 120 pupils. Find in grammes, the amount of maize flour the cook would require to feed 3 pupils.

$1Kg = 1000g$

$24Kg = 24 \times 1000g$

$24000g$

$24000g$ feed 120 pupils

Amount of flour required

120 pupils require 24000 grammes

1 pupil requires $\frac{24000 \text{ grammes}}{120}$

3 pupils require $\left(\frac{24000}{120} \times 3\right)$ grammes

$= (200 \times 3)$ grammes

$= 600$ grammes

16. Akiiki bought a suit at Kenya shillings (Ksh) 11,500. If the exchange rate was 1 Ksh = Ug.sh 32, how much money would Akiiki have paid for the suit in Uganda shillings (Ug.sh)?

1 Ksh. = Ugsh 32

11,500Ksh = Ug.sh 32 x 11500

= Ug.sh 368,000.

$$\begin{array}{r} 115 \\ \times\ 32 \\ \hline 230 \\ +345 \\ \hline 3680 \end{array}$$

17. Solve: $3 - 2y < 9$

$3 - 2y < 9$

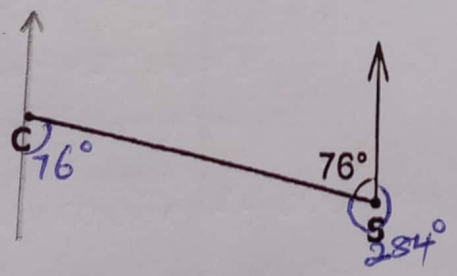
$3 - 3 - 2y < 9 - 3$

$-2y < 6$

$\frac{-2y}{-2} > \frac{6}{-2}$,

$y > -3$

18. The diagram below shows the position of a church (**C**) from a school (**S**).



Find the bearing of the church from the school.

$360° - 76°$

$^{2\,15}360°$

$- \ 76°$

$284°$

The church is on the bearing of 284° from the school

19. If today is Monday and a cake baked today can expire after 16 days, what day of the week will the cake expire?

S	M	T	W	TH	FR	S
0	1	2	3	4	5	6

Day + 16 = — (mod 7)

1 + 16 = — (mod 7)

17 ÷ 7 = 2 rem 3 (mod 7)

= 3 (mod 7)

The cake will expire on Wednesday

20. One morning, the temperature on top of a mountain was -3°C. The temperature rose by 8°C in the afternoon. Find the afternoon temperature.

Afternoon temperature

$-3°C + 8°C$

$+5°C$

$5°C$

+ve: + + + + + + + +

-ve: − − −

+5

SECTION B: 60 MARKS

*Answer **all** the questions in this section.*
Marks for each question are indicated in the brackets.

21. Work out: $\dfrac{2.92-2.36}{0.068+0.012}$ *(04 marks)*

$(2\cdot92-2\cdot36)\div(0\cdot068+0\cdot012)$

$\left(\frac{292}{100}-\frac{236}{100}\right)\div\left(\frac{68}{1000}+\frac{12}{1000}\right)$

$\left(\frac{292-236}{100}\right)\div\frac{80}{1000}$

$\frac{56}{100}\div\frac{80}{1000}$

$\frac{7}{56}{}_{100}\times\frac{1000}{80}{}_{1}$

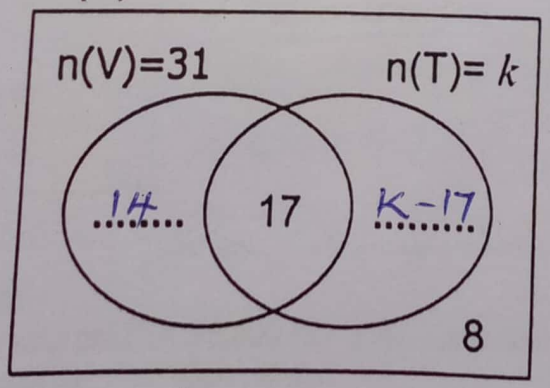
$=\frac{7\times1}{1\times1}$

$=7$

22. In a class, 31 pupils like volleyball (V) and k pupils like table tennis (T). 17 pupils like both games while 8 pupils do not like any of the two games. The number of pupils who like table tennis only is twice the number of those who do not like any of the two games.

(a) Use the given information to complete the Venn diagram below. *(04 marks)*

$n(\varepsilon)=$ 55



n(V) only
31-17 = 14

n(T) only
K-17

value of K

K-17 = 8×2
K-17 = 16
K-17+17 = 16+17
K = 33

n(ε)

K-17+17+14+8 =
33-17+17+14+8
= 33+22
= 55
n(ε) = 55

8

(b) Find;

(i) the value of k. (01 mark)

$k - 17 = 2 \times 8$

$k = 16 + 17$

$k = 33$

(ii) the probability that a pupil picked at random from the class likes both volleyball and table tennis. (01 mark)

$\text{probability} = \frac{n(E)}{n(SS)}$

$\text{probability} = \frac{17}{55}$

23. A taxi and a bus were hired to transport people for a function. The taxi transports 14 people when full while the bus transports 69 people when full. The taxi made five trips and the bus made one trip. The taxi and the bus made the trips when full.

(a) Find the total number of people that were transported to the function. (03 marks)

Taxi

$= (5 \times 14)$ passengers

$= 70$ passengers

Bus

(1×69) passengers

$= 69$ passengers.

Total number of people

$= 69 + 70$

$= 139$ people

(b) The taxi owner was paid sh 56,000 per trip. Calculate the amount of money that was paid for each person. (02 marks)

1 trip costs sh. 56000

5 trips cost sh. 56000×5

$=$ sh. 280000

Amount paid by each person

$= \text{sh.} \frac{280000}{70}$

$= \text{sh. } 4,000$

OR

Amount paid per person

$= \text{sh.} \frac{56000}{14}$

$= \text{sh.} \frac{28000}{7}$

$= \text{Sh. } 4,000$

Turn Over

24. Given that $202_p = 1221_{three}$, find the value of p. (04 marks)

$2\,0\,2_p = 1\,2\,2\,1_{three}$

$(2\times p^2)+(0\times p^1)+(2\times p^0) = (1\times 3^3)+(2\times 3^2)+(2\times 3^1)+(1\times 3^0)$

$2p^2+0\times p+2\times 1 = (1\times 3\times 3\times 3)+(2\times 3\times 3)+(2\times 3)+(1\times 1)$

$2p^2+0+2 = 27+18+6+1$

$2p^2+2 = 52$

$2p^2+2-2 = 52-2$

$2p^2 = 50$

$\frac{2p^2}{2} = \frac{50}{2}$

$\sqrt{p^2} = \sqrt{25}$

$p = \sqrt{5^2}$

$p = 5$

$\therefore p$ is base five

25. The table below shows the amount of money Rukia paid for food stuff to a businesswoman after she was given a discount of sh 2,200.

(a) Study and complete the table. (03 marks)

Item	Quantity	Cost per kg	Amount
Rice	4 kg	sh 3,800	sh 15200
Beans	6 kg	sh 5,000	sh 30,000
Irish Potatoes	0.5 kg	sh 3200	sh 1,600
Total			**sh 46,800**

Rice
sh 3800 × 4
sh 15200

Beans
6
sh 30000
sh 5000
6

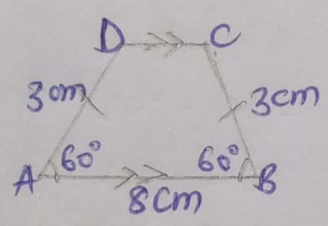
Irish potatoes
sh 1600 ÷ 5
sh 1600 × 2/10
= 1/5
sh 3200

(b) Find how much money Rukia would have paid without the discount. (02 marks)

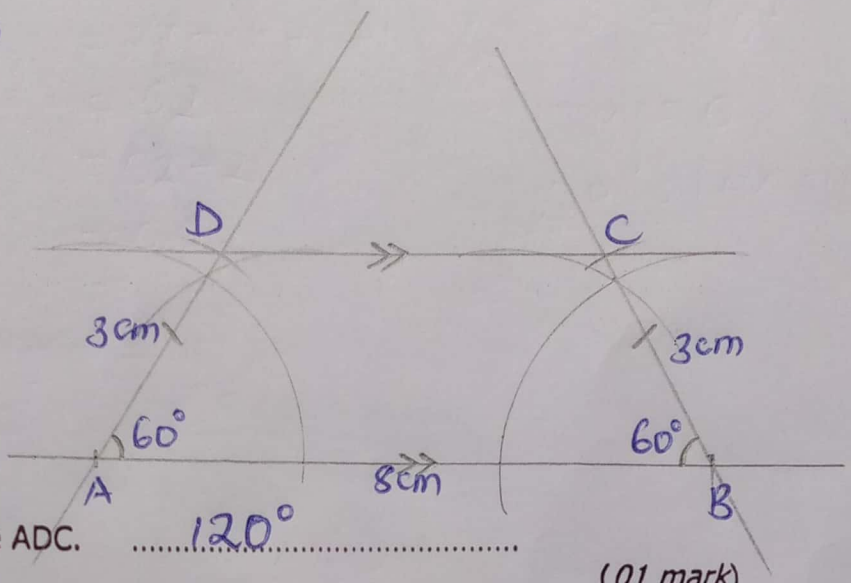
sh 46800
+ sh 2200
sh 49,000

26. (a) Using a ruler and a pair of compasses only, construct a trapezium ABCD in which line AB = 8 cm, angle DAB = angle ABC = 60° and line AD = BC = 3 cm. *(04 marks)*

Sketch



Accurate diagram



(b) Measure angle ADC. .....120°..... *(01 mark)*

27. A motorcycle tyre made 40 complete turns to cover a distance of 5280 cm. Calculate the radius of the tyre. (Use $\pi = \frac{22}{7}$) *(04 marks)*

Circumference of tyre

$C = \frac{D}{R_{132}}$

$C = \frac{5280\text{cm}}{40}$

$C = 132\text{cm}$

$\pi D = C$

$\frac{22}{7} \times D = 132\text{cm}$

$\frac{22D}{7} \times 7 = 132\text{cm} \times 7$

$22D = 132\text{cm} \times 7$

$\frac{22D}{22} = \frac{132\text{cm} \times 7}{22}$

$D = 42\text{cm}$

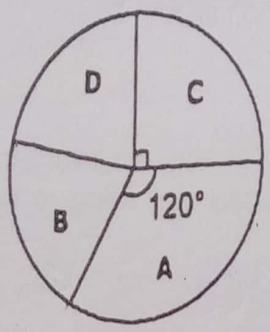
Radius

$R = \frac{\text{Diameter}}{2}$

$R = \frac{42\text{cm}}{2}$

$R = 21\text{cm}$

28. The pie chart below represents the population of four towns A, B, C and D. The population of town A is 3000 people and that of town B is 1800 people. Study the pie chart and use it to answer the questions that follow.



Calculate the population of;

(a) town C. (04 marks)

Population of all towns: 3,000 ≡ 120°

$\left(3{,}000 \div \frac{120}{360}\right)$ people

$\left(3{,}000 \times \frac{360}{120}\right)$ people

9,000 people ≡ population of town C

$\frac{90}{360} \times 9000^{4500}$

$= 2{,}250$ people

(b) town D. (02 marks)

Town D $= (9000 - (3{,}000 + 2{,}250 + 1800))$ people

$= (9{,}000 - 7{,}050)$ people

$= 1{,}950$ people

29. (a) Solve: $\frac{5t-6}{2} = t + 12$ (02 marks)

$\frac{5t-6}{2} = t + 12$

$2 \times \frac{5t-6}{2} = 2(t+12)$

$5t - 6 = 2t + 24$

$5t - 6 + 6 = 2t + 24 + 6$

$5t = 2t + 30$

$5t - 2t = 2t - 2t + 30$

$3t = 30$

$\frac{3t}{3} = \frac{30}{3}$

$t = 10$

(b) Subtract $(2m - 3)$ from $(5m + 2)$. *(02 marks)*

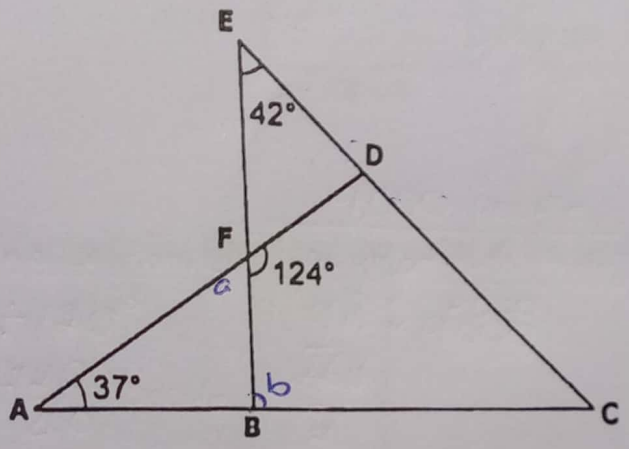
$(5m+2)-(2m-3)$

$5m+2-2m+3$

$5m-2m+2+3$

$3m+5$

30. In the diagram below, angle DAC = 37°, angle BEC = 42° and angle BFD = 124°. Study the diagram and answer the questions that follow.



Find the size of;

(a) angle EBC. *(03 marks)*

$a+124^\circ = 180^\circ$

$a+124^\circ-124^\circ = 180^\circ-124^\circ$

$a = 56^\circ$

$b = 37^\circ + a$

$b = 37^\circ + 56^\circ$

$b = 93^\circ$

$\therefore \angle EBC = 93^\circ$

(b) angle DCA. *(02 marks)*

$\angle DCA + b + 42^\circ = 180^\circ$

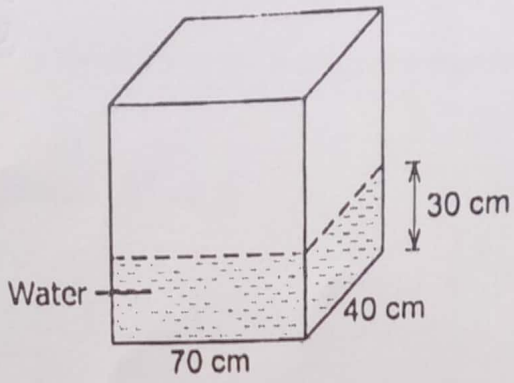
$\angle DCA + 93^\circ + 42^\circ = 180^\circ$

$\angle DCA + 135^\circ = 180^\circ$

$\angle DCA + 135^\circ - 135^\circ = 180^\circ - 135^\circ$

$\angle DCA = 45^\circ$

31. The diagram below shows a tank with a rectangular base containing some water. Study and use it to answer the questions that follow.



(a) Calculate the volume of the water in the tank. (*02 marks*)

$V = B.A \times H$

$V = L \times W \times H$

$V = 70cm \times 40cm \times 30cm$

$V = 2800cm^2 \times 30cm$

$V = 84,000cm^3$

(b) If 28 litres of the water was removed for washing clothes, calculate the height of the water that remained in the tank. (*04 marks*)

Volume removed

1 litre $= 1000cm^3$

28 litres $= 28 \times 1000cm^3$

$= 28000cm^3$

Volume remained

$84000\ cm^3$

$-\ 28000\ cm^3$

$56000\ cm^3$

Height of water remained

$L \times W \times H = V$

$70cm \times 40cm \times H = 56000\ cm^3$

$2800cm^2 H = 56000cm^3$

$\frac{2800cm^2 H}{2800cm^2} = \frac{56000cm^2 \times cm}{2800cm^2}$

$H = 20 \times cm$

$H = 20cm$

32. A motorcyclist left home for town at 8:00 a.m. riding at a speed of 40 km/h. After 30 minutes, he got a flat tyre which took him 45 minutes to repair. The distance between the home of the motorcyclist and town is 68 km.

(a) Find the distance the motorcyclist had covered before he got the flat tyre. *(02 marks)*

$D = S \times T$

$D = 40\text{Km/h} \times \left(\frac{30}{60}\right)\text{h}$

$D = \frac{40\text{Km}}{\text{h}} \times \frac{1\text{h}}{2}$

$D = 20\text{Km}$

(b) Calculate the speed at which the motorcyclist had to ride in order to reach town at 10:00 a.m. *(04 marks)*

Remaining distance

68Km − 20Km

48Km

Total Time Taken

H	M
10	00
− 8	00
2	00

2 hours

Remaining time

$2\text{h} - (30\text{mins} + 45\text{mins})$

$2\text{h} - \left(\frac{30}{60}\right)\text{h} + \left(\frac{45}{60}\right)\text{h}$

$2\text{h} - \left(\frac{1}{2}\text{h} + \frac{3}{4}\text{h}\right)$

$2\text{h} - \left(\frac{1}{2} \times \frac{4}{4}\right) + \left(\frac{3}{4} \times \frac{1}{1}\right)\text{h}$

$2\text{h} - \left(\frac{2+3}{4}\right)\text{h}$

$\frac{2\text{h}}{1} - \frac{5}{4}\text{h}$

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

$\left(\frac{8}{4} - \frac{5}{4}\right)\text{h}$

$\frac{3}{4}\text{h}$

$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$

$S = 48\text{Km} \div \frac{3}{4}\text{h}$

$S = 48\text{Km} \times \frac{4}{3}\text{h}$

$S = 16\text{Km} \times \frac{4}{1}\text{h}$

$S = 64\text{Km/h}$

15 END