UGANDA NATIONAL EXAMINATIONS BOARD

PRIMARY LEAVING EXAMINATION

2023

MATHEMATICS

Time Allowed: 2 hours 30 minutes

	Random No.						Personal No.		
+256	7	7	6	9	9	0	3	2	7

Candidate's Name: ..... AHEREZA AMON .....

Candidate's Signature: .....

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		

SECTION A: 40 MARKS

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

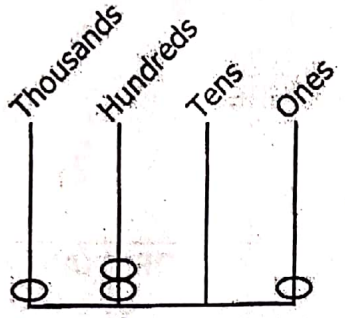
*Questions **1** to **20** carry two marks each.*

1. Work out: 63 + 54

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

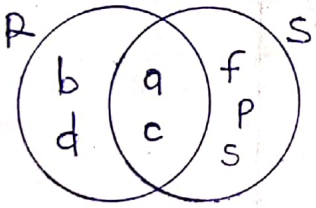
$$(60+3)+(50+4)$$
$$(60+50)+(3+4)$$
$$110+7$$
$$117$$

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



= 1201

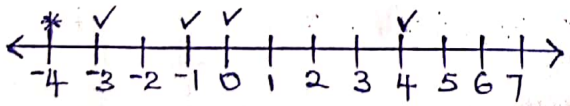
3. Given that R = {a, b, c, d} and S = {a, f, p, c, s}, find n(R∪S).



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

$n(R \cup S) = 7$

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



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.

Sun = 0
Mon = 1
Tue = 2
Wed = 3 ✓
Thur = 4
Frid = 5
Sat = 6

3 + 30 = ___ (finite 7)
33 ÷ 7 = 4 r 5 (finite 7)
3 + 30 = 5 (finite 7)

Friday

6. Change 750 millilitres into litres.

1 millilitre = $\frac{1}{1000}$ litres

750 ml = $\frac{1}{1000} \times 750$

= $\frac{75}{100}$

= 0·75 litres

7. Find the value of $4^2 + 3^2 \times 9^0$.

$4^2 + 3^2 \times 9^0$

$(4 \times 4) + (3 \times 3) \times 1$

$16 + (9 \times 1)$

$16 + 9$

25

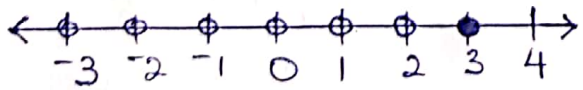
8. A meeting that took 2 hours and 15 minutes ended at 1:20 p.m. At what time did the meeting begin?

1:20 pm
+12:00 hours
13 20 hours

Hours	Min
13	20
−2	15
11	05

11:05 am

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



$P = \{3, 2, 1, 0, -1, -2, -3 \ldots\}$

10. Find the next number in the sequence:

1, 8, 27, 64, ..125..

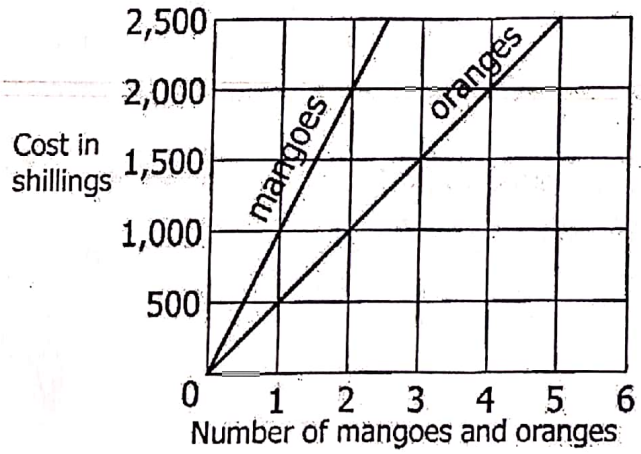
$1 \times 1 \times 1 = 1$
$2 \times 2 \times 2 = 8$
$3 \times 3 \times 3 = 27$
$4 \times 4 \times 4 = 64$
$5 \times 5 \times 5 = 125$

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

$14 \div 3 = 4$ rem 2
$4 \div 3 = 1$ rem 1
$1 \div 3 = 0$ rem 1

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

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.

2 Mangoes = sh. 2000
3 Oranges = sh. 1500

sh. 2000
+ sh. 1500
sh. 3500

(sh. 1000 × 2) + (sh. 500 × 3)
sh. 2000 + sh. 1500
sh. 3500

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

Multiples of 9 = {9, 18, 27, 36 ...}

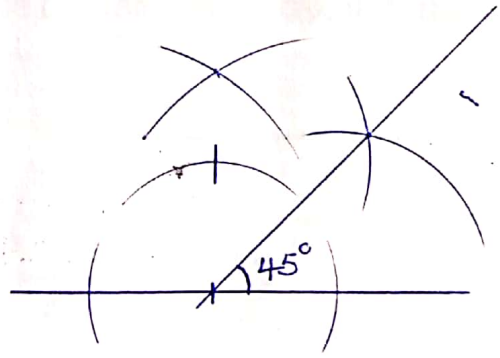
$7+8=15$

$15+t=18$

$15-15+t=18-15$

$t=3$

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.

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

$$= \frac{62+73+78}{3}$$

$$= \frac{213}{3}$$

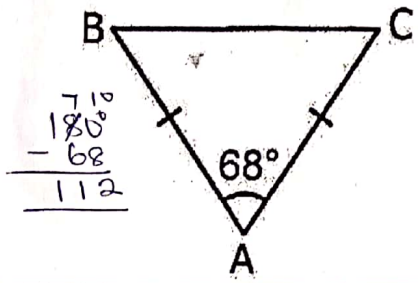
$= 71$ eggs

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.

SP = BP − Loss

sh. 45,000
− sh. 1,500
sh. 43,500

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



180° − 68° = 112°

$\angle ABC = \frac{112°}{2}$

$\angle ABC = 56°$

$\angle ABC = \angle ACB$

$\angle ABC + \angle ABC + 68° = 180°$

$2(\angle ABC) + 68° = 180°$

$-68° \quad -68°$

$\frac{2(\angle ABC)}{2} = \frac{112°}{2}$

$\angle ABC = 56°$

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

$\pi D = C \qquad D = 2r$

$\frac{22}{7} \times 2r = 88\text{cm} \div \left(\frac{22}{7} \times 2\right)$

$\frac{22}{7} \times 2$

$r = 88\text{cm} \times \frac{7}{22} \times \frac{1}{4}$

$r = 14\text{cm}$

The length of the minute hand is 14cm

$\pi D = C$

$\frac{22}{7} D = 88\text{cm}$

$7 \times \frac{22D}{7} = 88\text{cm} \times 7$

$\frac{22D}{22} = \frac{88\text{cm} \times 7}{22}$

$D = 4\text{cm} \times 7$

$D = 28\text{cm}$

radius $= \frac{28\text{cm}}{2}$

$= 14\text{cm}$

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?

$\frac{20}{25} \times \frac{2}{2} = \frac{40}{50}$

$\frac{20}{25} \times \frac{3}{3} = \frac{60}{75}$

$\frac{20}{25} \times \frac{4}{4} = \frac{80}{100}$

$\frac{18}{20} \times \frac{2}{2} = \frac{36}{40}$

$\frac{18}{20} \times \frac{3}{3} = \frac{54}{60}$

$\frac{18}{20} \times \frac{4}{4} = \frac{72}{80}$

$\frac{18}{20} \times \frac{5}{5} = \frac{90}{100}$

The pupil performed better in second term mathematics test.

LCD = 100

1st term

$\frac{20}{25} \times \frac{4}{100}$

20×4

80

2nd term

$\frac{18}{20} \times \frac{5}{100}$

18×5

90

The pupil performed better in second term Mathematics test.

SECTION B: 60 MARKS

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

Marks for each question are indicated in brackets.

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

$\frac{1}{2} - \left(\frac{1}{4} \div \frac{4}{5}\right)$ BODMAS

$\frac{1}{2} - \left(\frac{1}{4} \times \frac{5}{4}\right)$

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

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

16

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

$\frac{3}{16}$

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

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

$\frac{27^{3}}{100} \times \frac{12}{10} \times \frac{10}{9_{1}}$

$\frac{3 \times 12 \times 1}{100 \times 1 \times 1}$

$\frac{36}{100}$

0.36

$\frac{027 \times 1.2 \times 1000}{0.9 \times 1000}$

$\frac{27 \times 12}{100}$

$\frac{36}{100}$

0.36

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

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

$= \frac{(400 \div 1000)\text{km}}{(48 \div 3600)\text{hours}}$

$= \frac{400}{1000} \div \frac{48}{3600}$ Km/hour

$= {}^{1}\frac{4}{10} \times \frac{3600^{30}}{48_{1}}$ km/hour

$= 30$ Km/hour

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

$= \frac{400\text{m}}{48\text{s}}$

$= \frac{50^{25}}{6_{3}}$ m/s

$= \frac{25}{3}$ m/s

m/s to km/hr

$\frac{25}{3} \div 1000$ km

$1 \div 3600$ hours

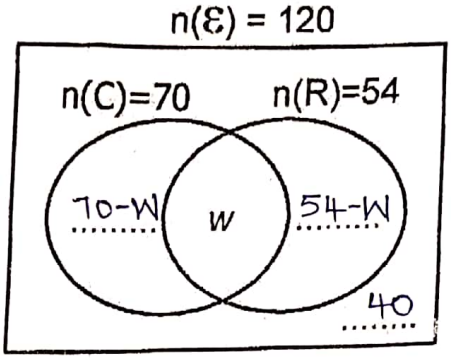
$\left(\frac{25}{3} \times \frac{1}{1000}\right) \div \frac{1}{3600}$ Km/hr

$\frac{25}{3_{1}} \times \frac{1}{1000_{1}} \times \frac{3600}{1}$ Km/hr

30 Km/hour

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)*

$W = (70 + 54 + 40) - 120$

$W = 164 - 120$

$W = 44$ guests

44 guests attended both the 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)*

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

$2 \times 3 \times 3$

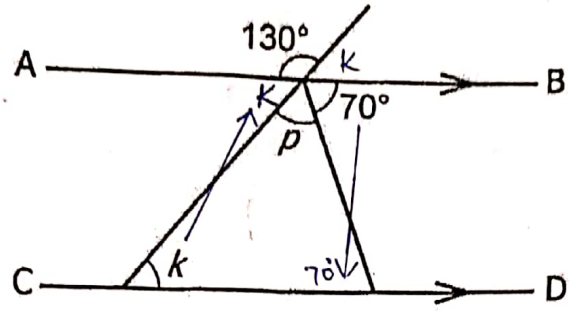
6×3

18 pupils

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

$\frac{126}{18} = 7$ groups

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



Find the size of;

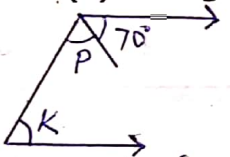
(a) angle p. *(02 marks)*

$P + 70° = 130°$ (Vert. opp. $\angle$s)

$P + 70° - 70° = 130° - 70°$

$P = 60°$

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

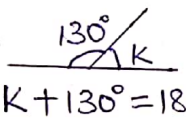


$K + 60° + 70° = 180°$

$K + 130° = 180°$

$K + 130° - 130° = 180° - 130°$

$K = 50°$

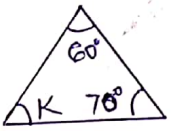


$K + 130° = 180°$

$K + 130° = 180°$

$-130 \quad -130$

$K = 50°$



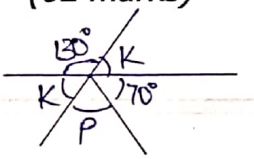
$K + 60° + 70° = 180°$

$K + 130° = 180°$

$K + 130° = 180°$

$-130 \quad -130$

$K = 50°$



$K + K + 60° + 70° + 130° = 360°$

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)*

40×250 grammes

10000 grammes

$1000g = 1kg$

$10000g = \frac{10000}{1000}$

$= 10kg$

$1g = \frac{1}{1000}kg$

$250g = 250 \times \frac{1}{1000}$

$= \frac{25}{100}$

$= 0.25kg$

$0.25kg \times 40$

$10kg$

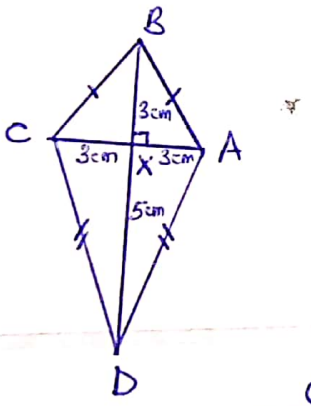
$0.25 \times 40 = 10.00$

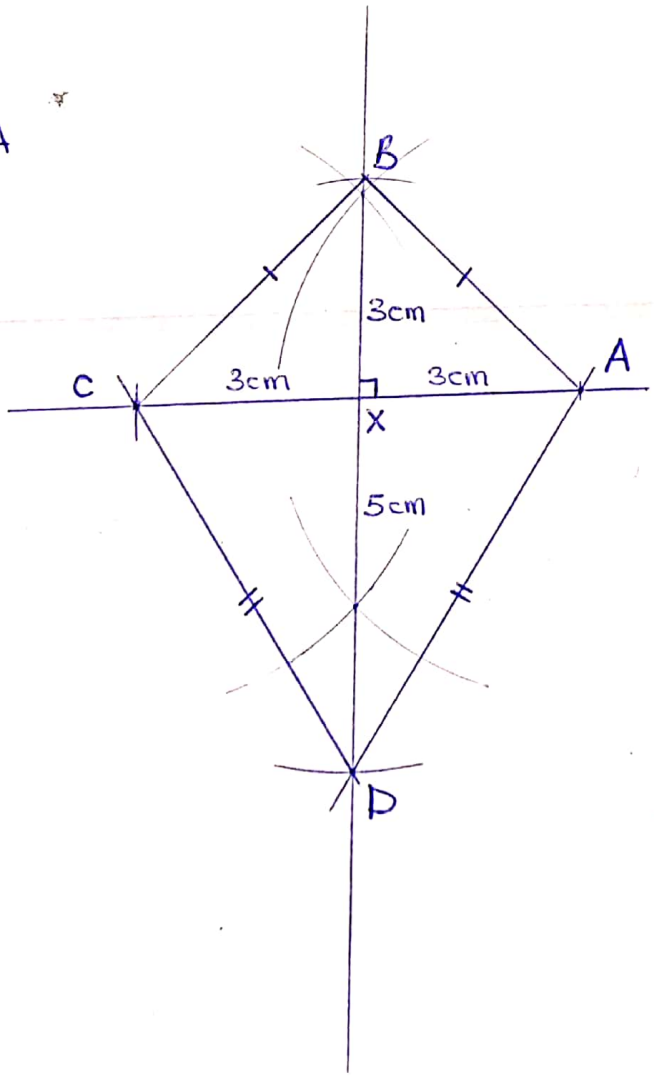
(b) A family uses a packet of salt every 5 days. Find the number of days the carton will last the family. *(02 marks)*

5 X 40
200 days

1 packet lasts 5 days
40 packets last 5 X 40
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).*





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 age of the daughter be d

	Man	daughter	Sum
Now	4d	d	
Ago	4d-6	d-6	48

$4d-6+d-6=48$

$4d+d-6-6=48$

$5d-12=48$

$5d-12+12=48+12$

$\frac{5d}{5}=\frac{60}{5}$

$d=12$

The daughter is 12 years old

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

$4d-6$

$(4\times12)-6$

$48-6$

42 years

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. $4,400\times600$

= 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)*

Ksh. $\frac{\overset{100}{\cancel{200}} \times \overset{300}{\cancel{3900}}}{\cancel{26}_{1}}$

Ksh. 100×300

Ksh. 30000

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)*

In one day

First worker $= \frac{1}{6}$

Second worker $= \frac{1}{3}$

Both

$\frac{1}{6} + \frac{1}{3} = \frac{1+2}{6}$

$= \frac{\cancel{3}^{1}}{\cancel{6}_{2}}$

$= \frac{1}{2}$

$1 \div \frac{1}{2}$

$1 \times \frac{2}{1}$

2 days

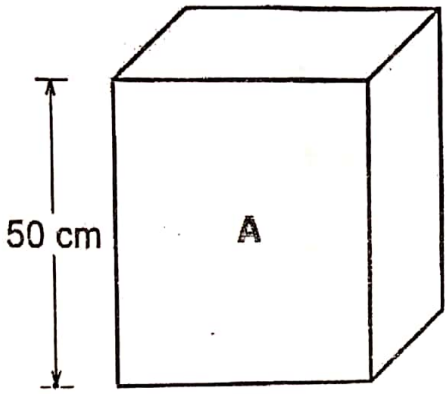
(b) The farmer paid each worker sh 15,000 per day. Calculate the amount of money the farmer spent to dig the piece of land. *(02 marks)*

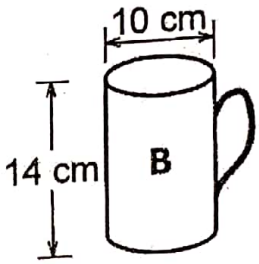
sh. $15{,}000 \times 2 \times 2$

sh. $15{,}000 \times 4$

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 $= \pi r^2 h$

$= \frac{22}{7} \times \frac{5}{10\text{cm}} \times \frac{5}{10\text{cm}} \times 14\text{cm}$

$= 22 \times 5 \times 5 \times 2 \text{ cm}^3$

$= 110 \times 10 \text{ cm}^3$

$= 1100 \text{ cm}^3$

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

$ba \times h = \text{Volume}$

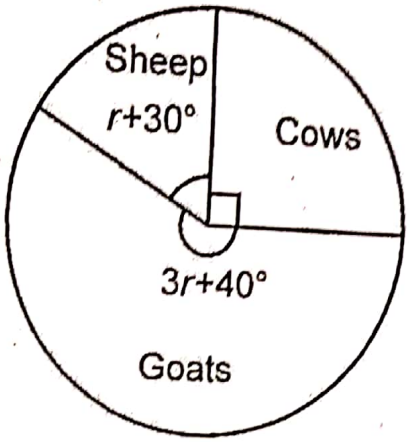
$ba \times 50\text{cm} = 1100\text{cm}^3 \times 40$

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

$ba = \frac{220 \times 4 \text{ cm} \times \text{cm} \times \text{cm}}{1\text{cm}}$

$ba = 880\text{cm}^2$

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)*

$360° - 90° = 270°$

$r + 30° + 3r + 40° = 270°$

$4r + 70° = 270°$

$4r + 70° - 70° = 270° - 70°$

$\frac{4r}{4} = \frac{200°}{4}$

$r = 50°$

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

$(3r + 40°) - (r + 30°)$

$3r + 40° - r - 30°$

$3r - r + 40° - 30°$

$2r + 30°$

$(2 \times 50°) + 10°$

$100° + 10°$

$110°$

let the total number of animals be W

$\frac{110°}{360°} \times W = 11$

$\frac{110°W}{360°} = 11 \div \frac{110°}{360°}$

$W = 11 \times \frac{360°}{110°}$

$W = 36$ animals

END

ANALYSIS BY CLASS

SECTION A

NO.	CLASS	TOPIC
01	P.2	OPN on WN
02	P.3	Whole nos
03	P.4	Set concepts
04	P.5	Integers
05	P.7	Integers
06	P.5	LMC
07	P.5	NP & S
08	P.5	D.T.S
09	P.6	Algebra
10	P.7	NP & S
11	P.7	Whole nos
12	P.4	Data handling
13	P.7	NP & S
14	P.6	LAG
15	P.6	Algebra
16	P.5	Data handling
17	P.5	Money
18	P.6	LAG
19	P.6	LMC
20	P.5	Fractions

SECTION B

NO.	CLASS	TOPIC
21	P.6	Fractions
22	P.6	D.T.S
23	P.6	Set concepts
24	P.6	NP & S
25	P.6	LAG
26	P.5	LMC
27	P.7	LAG
28	P.7	Algebra
29	P.6	Money
30	P.7	Fractions
31	P.7	LMC
32	P.6	Data handling

MARKS

P.1	00
P.2	02
P.3	02
P.4	04
P.5	18
P.6	45
P.7	29
TL	100%