UGANDA NATIONAL EXAMINATIONS BOARD

PRIMARY LEAVING EXAMINATION

2023

MATHEMATICS

Time Allowed: 2 hours 30 minutes

TR DENIS 0186518588

Random No.						Personal No.		

Candidate's Name: TR: SSERUGO DENIS

Candidate's Signature: MARKING GUIDE

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		

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Work out: 63 + 54

SECTION A: 40 MARKS

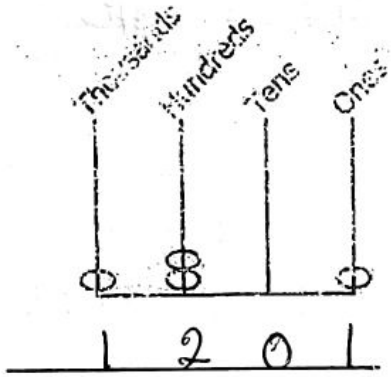
Answer all the questions in this section.

Write your answers in the spaces provided. Questions 1 to 20 carry two marks each.

1. Work out: 63 + 54

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

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



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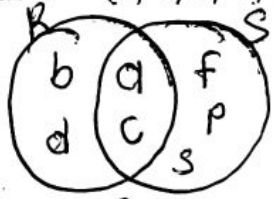
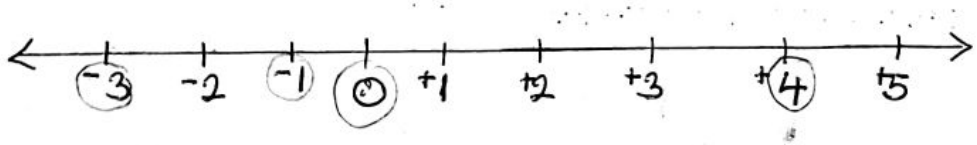
3. Given that R = {a, b, c, d} and S = {a, f, p, c, s}, find n(R∪S).



R∪S = {b, d, a, c, f, p, s}

n(R∪S) = 7

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



= -3, -1, 0, 4

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

30 − 1 = 29 days
3 + 29 = ___ (finite 7)
32 = ___ (finite 7)
32 ÷ 7 = 4 rem 4
4 stands for Thursday

The day was Thursday

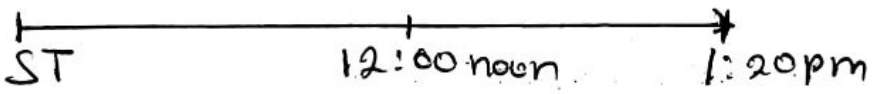
6. Change 750 millilitres into litres.

1000ml → 1l
750ml → $\frac{750}{1000}$ l
= 0.75l

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

= (4 × 4) + (3 × 3) × 1
= 16 + (9 × 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?

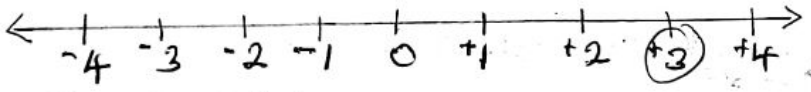


12:00 + 1:20 pm = 13 20

13 20 − 2 15 = 11 05

It begun at 11:05 am

9. Write the solution set for the inequality P ≤ 3.



P ≤ 3 = {+3, +1, 0, −1, −2 ----}

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10. Find the next number in the sequence:

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

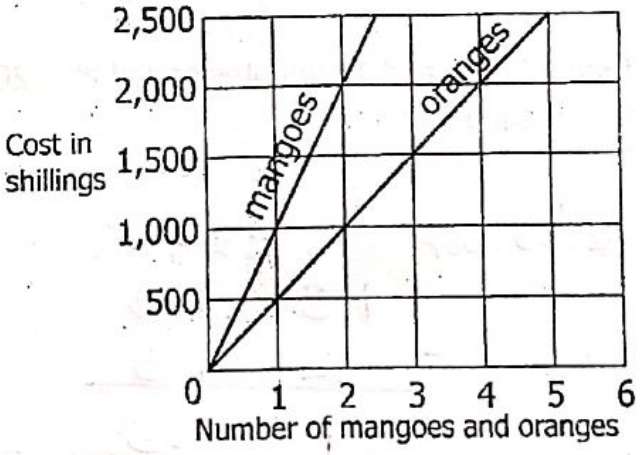
1^3 2^3 3^3 4^3 5^3

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

B	N	R
3	14	2
3	4	1
	1	

14ten = 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. 3500

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

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

$78t = 18$

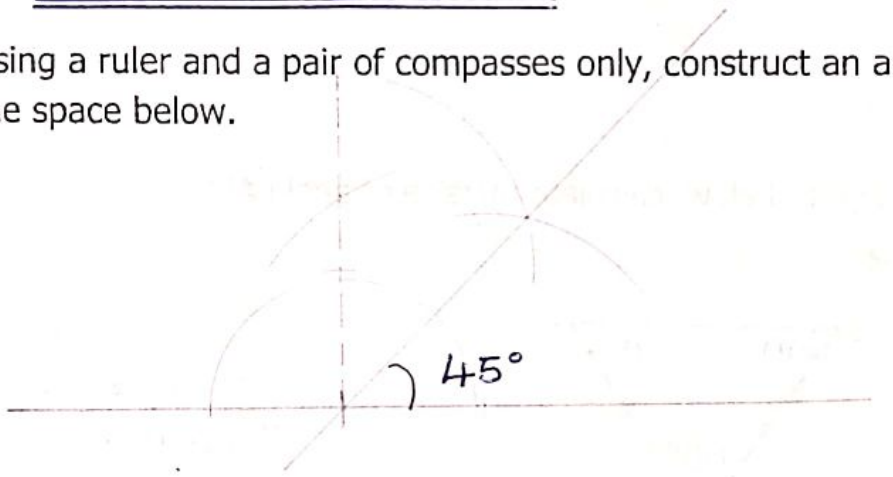
$7 + 8 + t = 18$

$15 + t = 18$

$15 - 15 + t = 18 - 15$

$t = 3$

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.

$$\text{Average} = \frac{\text{Sum of data}}{\text{Number of data}}$$

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

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

$$= 71\ \text{eggs}$$

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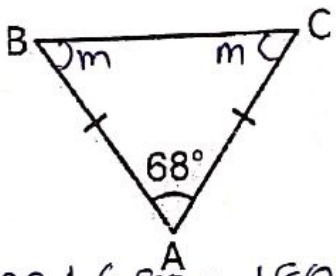
17. A businessman bought a watch at sh 45,000. He sold it and made a loss of sh 1,500. Find his selling price.

Selling price = Buying price − Loss.

Sh. 45000
Sh. − 1500
Sh. 43,500

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



$m + m + 68° = 180°$
$2m + 68° = 180°$
$2m + 68° - 68° = 180° - 68°$
$\frac{2m}{2} = \frac{112}{2}$ 56°

$m = 56°$
∴ Angle ABC = 56°

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

88cm = C
minute hand = r
$2\pi r = C$
$2 \times \frac{22}{7} \times r = 88cm$

$17 \times \frac{44r}{17} = 88cm \times 7$
$\frac{44r}{44} = \frac{88cm \times 7}{44}$

$r = 2cm \times 7$
$= 14cm$
∴ Minute hand = 14cm

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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?

LCM =

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

$= (2 \times 2) \times (5 \times 5)$

$= 4 \times 25$

$= 100$.

First term:

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

$1 = 80$

Second term:

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

$1 = 90$

∴ They performed better in second term.

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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)*

BODMAS

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

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

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

LCD = 16

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

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

$= \frac{3}{16}$

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

$\frac{(0.27 \times 1.2)}{0.9}$

$(0.27 \times 1.2) \div 0.9$

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

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

$= \frac{3 \times 12}{100} = \frac{36}{100}$

$= 0.36$

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

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

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

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

m/s to km/hr.

$= \frac{m/s \times 3600}{1000}$

$= \left[\left(\frac{25}{3_{1}} \times \frac{3600^{12}}{1000}\right)\right]$ km/hr

$\left(5 \times \frac{6}{25} \times \frac{1200}{1} \times \frac{1}{1000}\right)$ km/hr

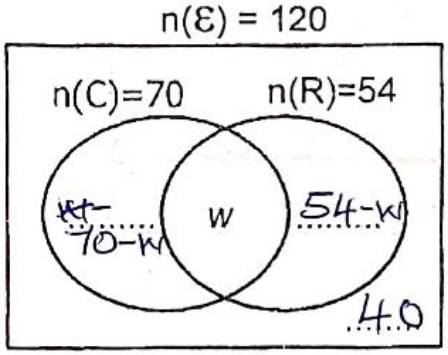
(5×6) km/hr

$= 30$ km/hr.

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)

$70-w+w+54-w+40=120$

$70+54+40-w+w+w-w=120$

$164-w=120$

$164-164-w=120-164$

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

$w=44$

∴ 44 guests.

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

$= 2 \times 3 \times 3$

$= 18$ pupils.

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

(02 marks)

$= 126 \div 18$

$= 7$ groups

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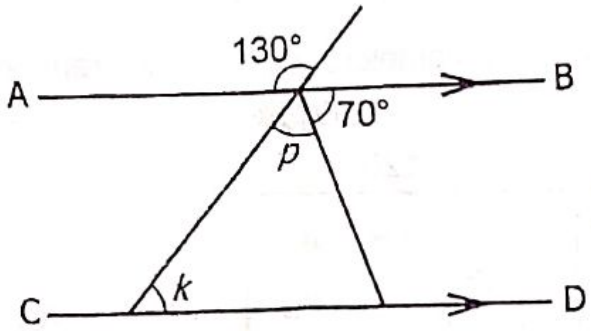
25. In the diagram below, line AB is parallel to line CD. Study the diagram and use it to answer the questions that follow.



Find the size of;

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

$P + 70° = 130°$

$P + 70° - 70° = 130° - 70°$

$P = 60°$

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

$(P + 70°) + K = 180°$

$(60° + 70°) + K = 180°$

$130° + K = 180°$

$130° - 130° + K = 180° - 130°$

$K = 50°$

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 $\rightarrow$ 250 g

40 packets $\rightarrow$ 40×250 g

$= 10{,}000$ g.

1,000 g $\rightarrow$ 1 kg

10,000 g $\rightarrow$ $\left(\frac{10{,}000}{1000}\right)$ kg

$= 10$ kg.

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

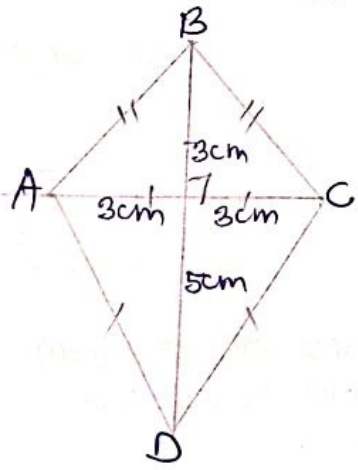
1 packet → 5 days

40 packets → (40 × 5) days

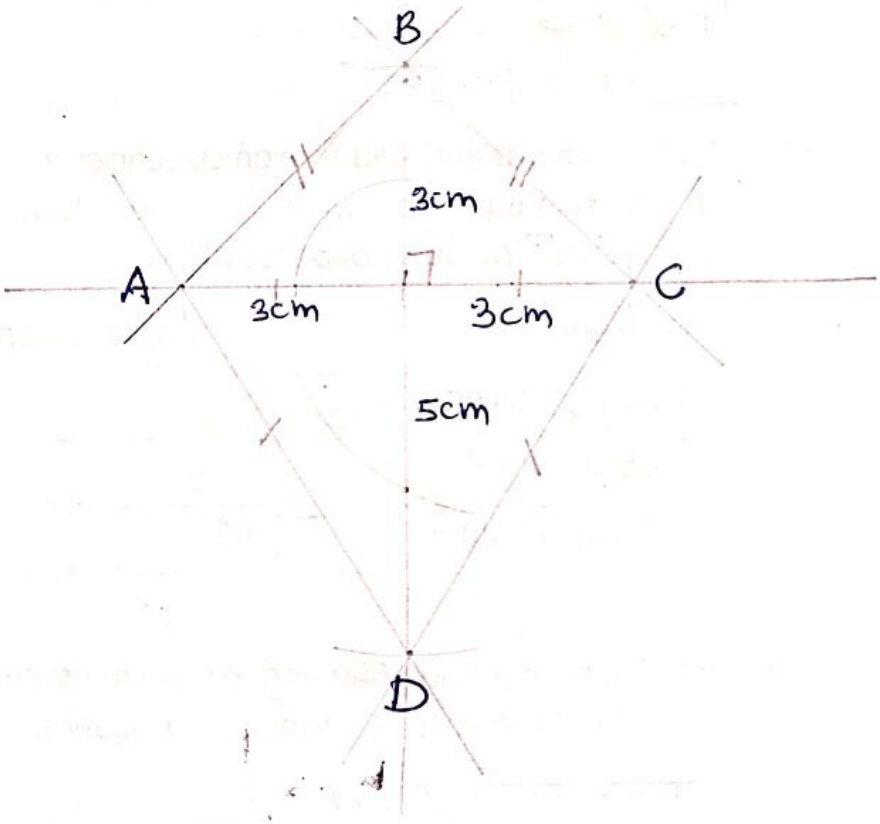
= 200 days

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 diagram



Accurate diagram:



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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 his daughter's age be K.

~~Now~~	Daughter	A man	Sum
~~Ago~~	K	4K	
Ago	K − 6	4K − 6	48

K − 6 + 4K − 6 = 48

K + 4K − 6 − 6 = 48

5K = 12 + 12 = 48 + 12

$\frac{5K}{5} = \frac{60}{5}$ 12

K = 12

= 12 years.

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

4K − 6

(4 × 12) − 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 us dollar ($)~~ →

1 pound £ → ugsh. 4400

£ 600 → ug.sh. 400 × 600

= ug.sh. 240,000.

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(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)

US dollars to ug.sh.

1 US $ → $ ug.sh. 3900

$ 200 → ug.sh. 3900 x 200

= ug.sh. 780,000.

ug.sh. to K.sh.

K.sh 26 → 1 ug.sh.

K.sh → ug.sh. $\frac{1}{26}$

1 ug.sh.

ug.sh. 780000 → K.sh. $\frac{780000}{26}$

= K.sh. 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)

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

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

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

= 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.

1 worker → sh. 15000

2 workers → 2 x sh. 15,000

= sh. 30,000

in 2 days.

2 days → 2 x sh. 30,000

= sh. 60000

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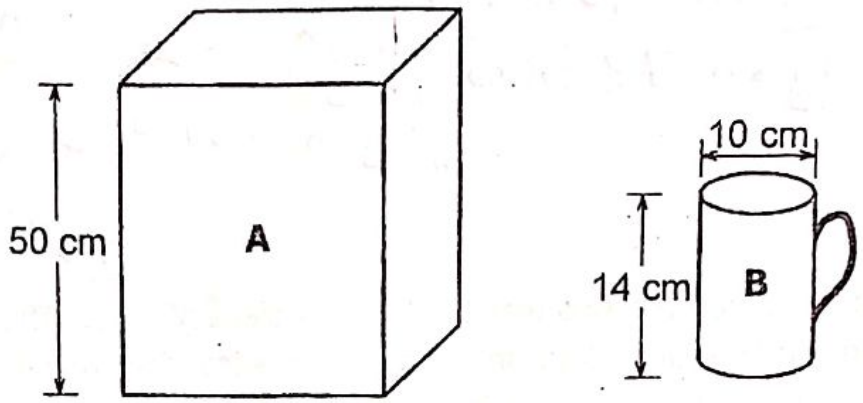
31. Forty full cups of water in cup **B** fill container **A**. Study the diagrams and answer the questions that follow.



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

V_o = base area × h.

= $\pi r^2 \times h$

= $\frac{22}{7_1} \times \frac{5}{2_1}\text{cm} \times \frac{5}{2_1}\text{cm} \times 2\text{cm}$

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

= $22 \times 50\ \text{cm}^3$

$V = 1{,}100\ \text{cm}^3$

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

Volume of A = Volume of B × 40

= $1{,}100\ \text{cm}^3 \times 40$

= $44000\ \text{cm}^3$

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

= $\frac{44{,}000\ \text{cm}^3}{150\ \text{cm}_1}$

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

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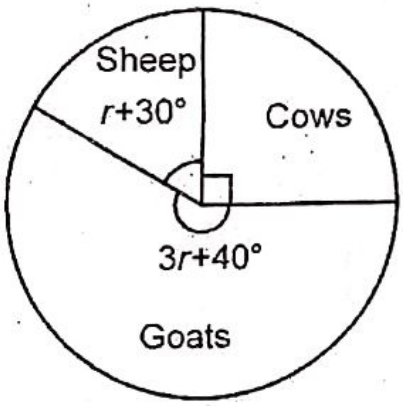
32. The pie chart below represents the number of animals reared on Amanya's farm. Study the pie chart and use it to answer the questions that follow.



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

$r + 30° + 3r + 40° + 90° = 360°$

$r + 3r + 30° + 40° + 90° = 360°$

$4r + 160° = 360°$

$4r + 160° - 160° = 360° - 160°$

$\frac{4r}{4} = \frac{200°}{4}$ (50°)

$r = 50°$

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

Goats $= 3r + 40°$

$= 3 \times 50° + 40°$

$= 150° + 40°$

$= 190°$

Sheep $= r + 30°$

$= 50° + 30°$

$= 80°$

More goats $= 190° - 80°$

$= 110°$

Let the total be y

$\frac{110°}{360°} \times y = 11$

$360° \times \frac{110°}{360°} \times y = 11 \times 360°$

$110°y = 11 \times 360°$

$\frac{110°}{110°} y = \frac{11 \times 360°}{110°}$

$y = 36$

∴ 36 animals

END

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