UGANDA NATIONAL EXAMINATIONS BOARD

PRIMARY LEAVING EXAMINATION

2023

MATHEMATICS

Time Allowed: 2 hours 30 minutes

Random No.						Personal No.		

Candidate's Name: TR. FRANCIS XERVIA

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		

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SECTION A: 40 MARKS

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

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

1. Work out: 63 + 54

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

OR.

60 + 3 + 50 + 4

(60 + 50) + (3 + 4)

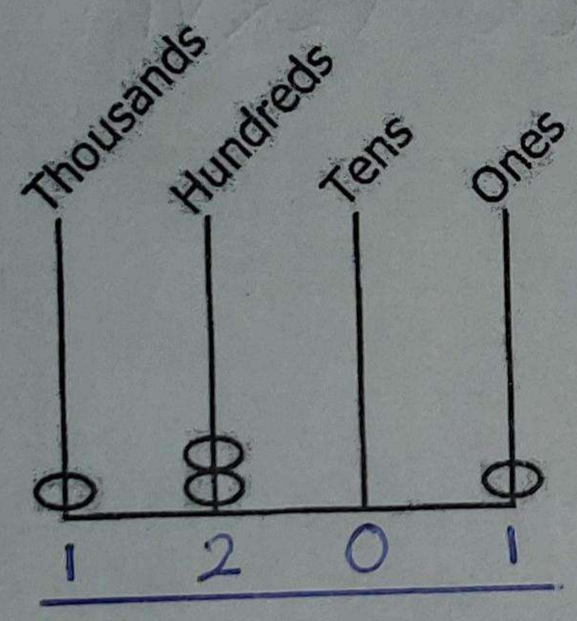
110 + 7

117

3 + 4 = 7

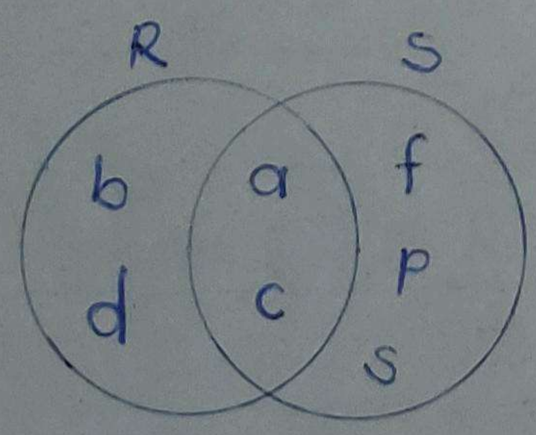
5 + 6 = 11

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



1201_{ten}

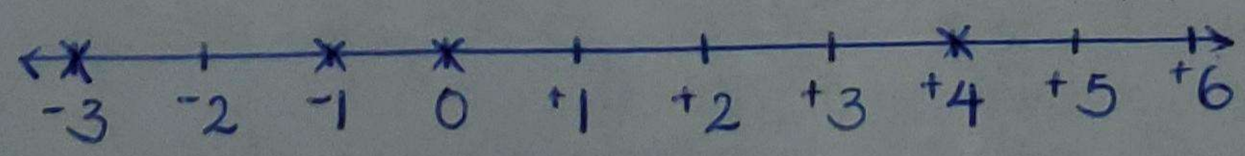
3. Given that R = {a, b, c, d} and S = {a, f, p, c, s}, find n(R∪S).



R∪S = {a, b, c, d, f, p, s}

n(R∪S) = 7

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



-3, -1, 0, 4

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

S	M	T	W	T	F	S
0	1	2	3	4	5	6

$3 + 30 = ___$ (finite 7)

$\frac{33}{7}$ = 4 rem 5 = ___ (finite 7)

5 (finite 7)

The training ended on Friday.

6. Change 750 millilitres into litres.

1000mL = 1 litre

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

750mL = $\left(\frac{1}{1000} \times 750\right)$ litres

$= \frac{75}{100}$ litres

$= 0.75$ litres

K H D L d c m
1 0 0 0

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

BODMAS

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

E.T = 1:20 p.m

D = 2hrs 15min

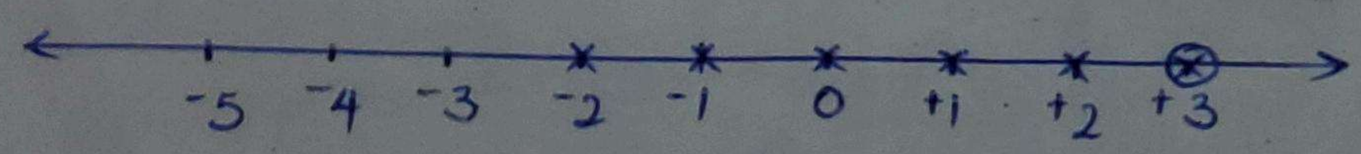
Ending time to 24 hours

12:00 hrs
+1:20 p.m
13 20 hrs

Starting time

13 20 hours
- 2:15 p.m
11:05 a.m.

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



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

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

Turn Over

10. Find the next number in the sequence:

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

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

$5^3 = (5 \times 5) \times 5$
$= 25 \times 5$
$= 125$

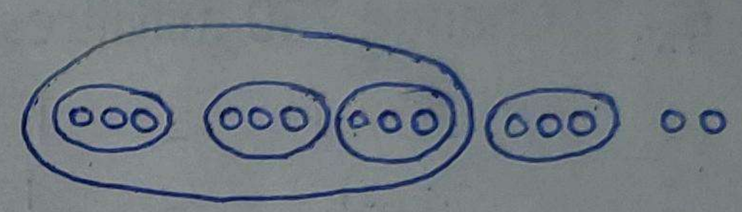
$$\begin{array}{r} {}^{2}25 \\ \times\ 5 \\ \hline 125 \\ \hline \end{array}$$

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

R.B	No.	Rem
3	14	2
3	4	1
	1	↗

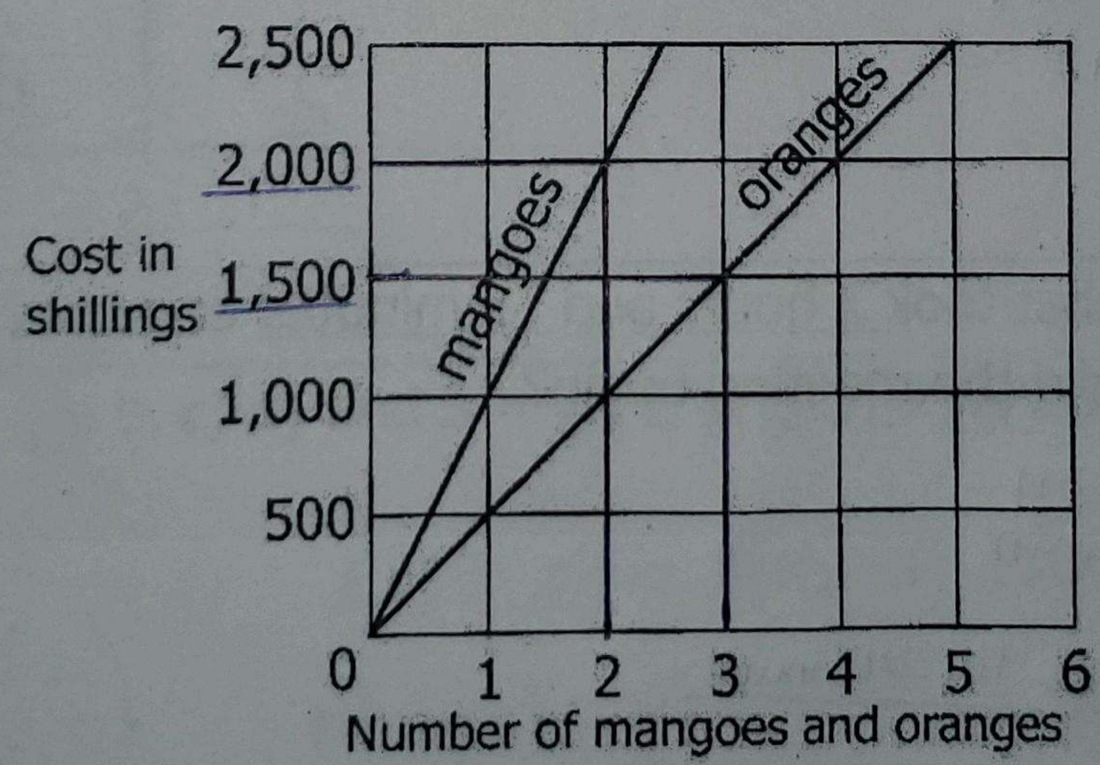
$14_{ten} = 112_{three}$

OR



1 group of three threes, One group of threes and 2 ones
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.

2mangoes → sh. 2000
3 oranges → +sh. 1500
sh. 3500

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

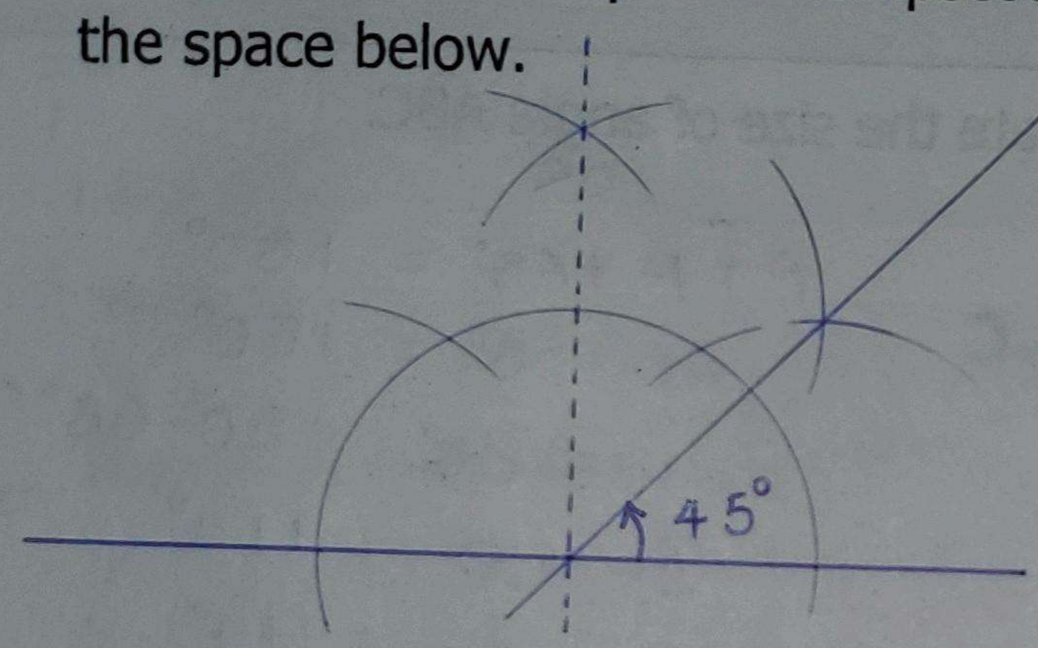
$7+8+t = 9$
$15+t = 9$
$15+t = (9+9)$
$15+t = 18$
$15-15+t = 18-15$
$0+t = 3$
$t = 3$

OR

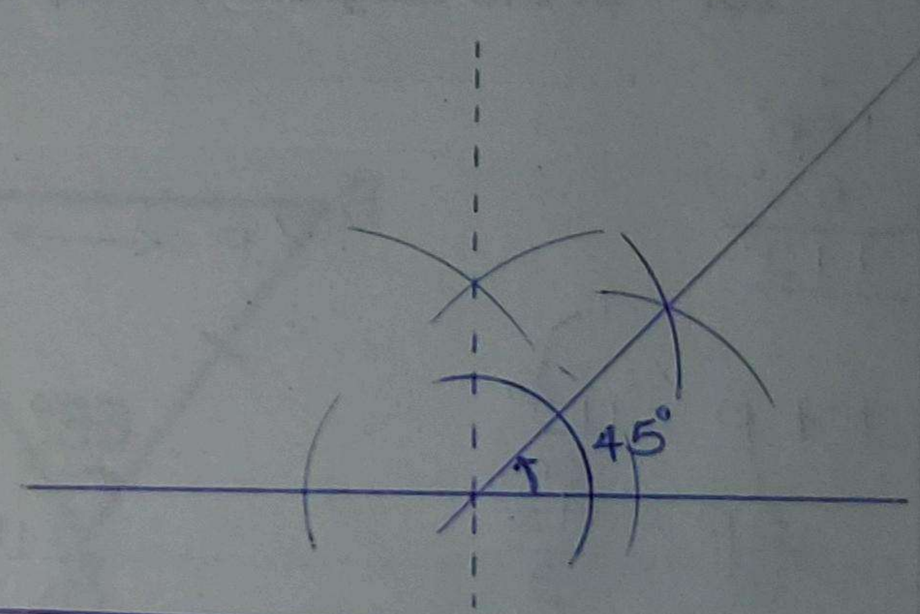
$7+8+t = 9$
$15+t = 9$
$(1+5)+t = 9$
$6+t = 9$
$6-6+t = 9-6$
$0+t = 9-6$
$t = 3$

$M_9 = \{9, 18, 27, 36 \ldots\}$
$7+8+t = 18$
$15+t = 18$
$15-15+t = 18-15$
$0+t = 3$
$t = 3$

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



OR



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

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

+			qqqqq
−	rr	r	qqq

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.

$$\text{Arerage} = \frac{\text{Sum of eggs}}{\text{Number of days}}$$
$$= \frac{(62+73)+78}{3}$$
$$= \frac{135+78}{3}$$
$$= \frac{\overset{71}{\cancel{213}}}{\cancel{3}_{1}}$$
$= 71$ eggs

$$\begin{array}{r} 62 \\ +73 \\ \hline 135 \\ \hline \end{array}$$
$$\begin{array}{r} 135 \\ 78 \\ \hline 213 \\ \hline \end{array}$$

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.

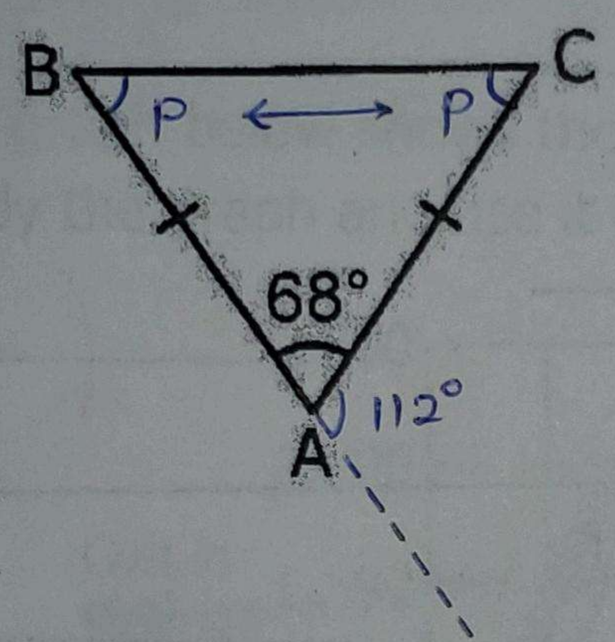
= sh. 45,000 - sh. 15000

= sh. 43,500

45000
- 150

4 10
4~~5~~000
- 1500
43500

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



$180° - 68° = 112°$

$p + p = 112°$

$\frac{2p}{2} = \frac{112°}{2}$

$p = 56°$

$\therefore ABC = 56°$

OR

$p + p + 68° = 180°$

$2p + 68° = 180°$

$2p + 68° - 68° = 180° - 68°$

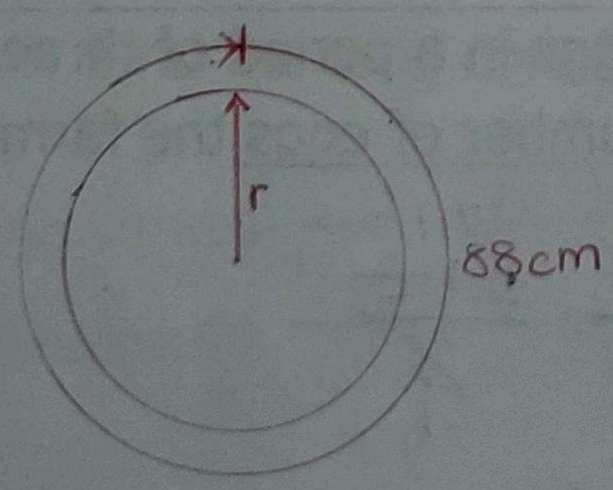
$2p + 0 = 112°$

$\frac{2p}{2} = \frac{112°}{2}$

$p = 56°$

$\therefore ABC = 56°$

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



$2\pi r = C$

$2 \times \frac{22}{7} r = 88cm$

$\frac{2}{7} \times \frac{44}{7} r = 88cm \times \frac{44}{7}$

$\frac{2}{44} \times \frac{44r}{7} = 88cm \times \frac{7}{44}$

$r = 2cm \times 7$

$r = 14cm$

Length = r

Length = 14cm

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?

Fractions to percentages

$\frac{20}{\cancel{25}_{1}} \times \cancel{100}^{4}\%$

$20 \times 4\%$

80%

$\frac{18}{\cancel{20}_{1}} \times \cancel{100}^{5}\%$

$18 \times 5\%$

90%

~~He~~ The pupil performed better in second term Mathematics test.

OR

LCM of 25 and 20

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

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

4×25

100

$\frac{20}{\cancel{25}_{1}} \times \cancel{100}^{4}$	$\frac{18}{\cancel{20}_{1}} \times \cancel{100}^{5}$
20×4	18×5
80	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)*

BODMAS

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

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

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

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

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

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

$\frac{3}{16}$

2	2	16
2	1	8
2	1	4
2	1	2
	1	1

$(2 \times 2) \times (2 \times 2)$

4×4

16

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

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

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

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

$\frac{36}{100}$

0.36

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

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

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

$= \frac{400\text{ km}}{1000} \div \frac{48\text{ hrs}}{3600}$

$= \frac{40\cancel{0}\text{ km}}{10\cancel{00}} \times \frac{\cancel{3600}^{3}}{\cancel{48}_{4}\text{ hrs}}$

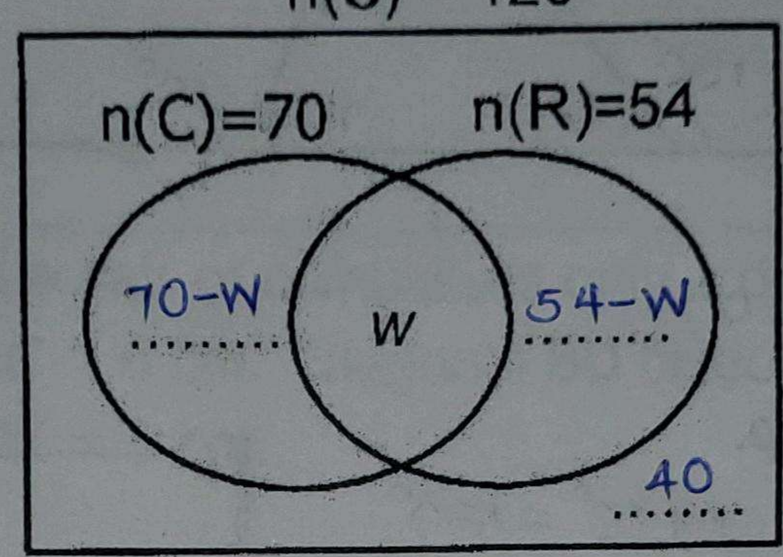
$= \cancel{40}^{10}\text{km} \times \frac{3}{\cancel{4}_{1}\text{hrs}}$

$\frac{(10 \times 3)\text{ km}}{1\text{hr}}$

30km/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)*

$54 + 70 - W + 40 = 120$

$54 + 70 + 40 - W = 120$

$164 - W = 120$

$164 - 164 - W = 120 - 164$

$0 - W = -44$

$-W = -44$

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

$W = 44$

$164 - 120 = 044$

Number of guests who attended both

(W) guests

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)*

GCF of 126, 90 and 72

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)*

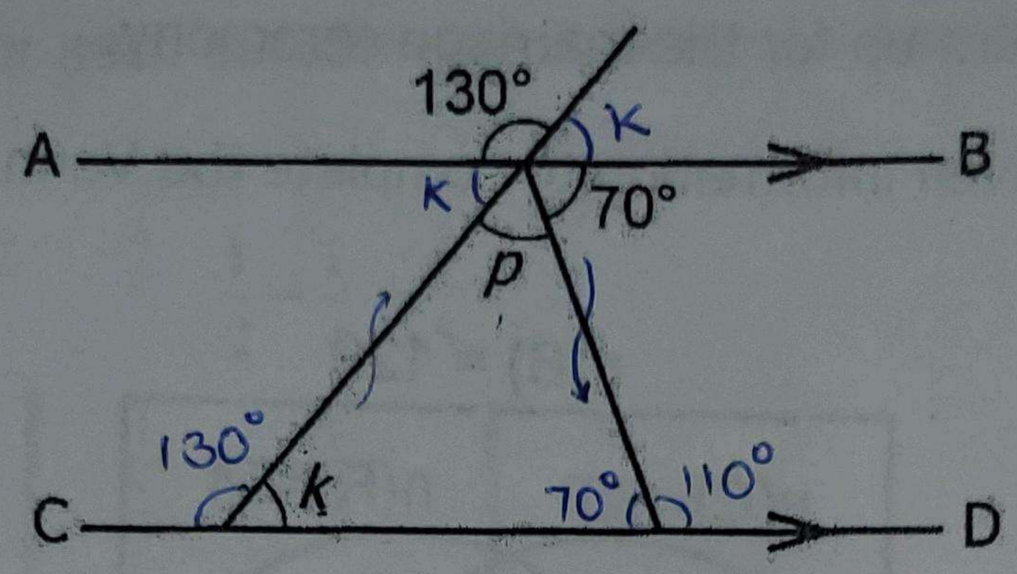
Primary five → 126 pupils.

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

$\frac{63}{9}$ groups

7 groups

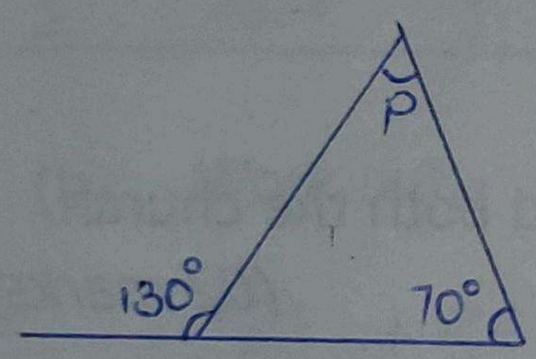
25. In the diagram below, line AB is parallel to line CD. Study the diagram and use it to answer the questions that follow.



$180° - 70° = 110°$

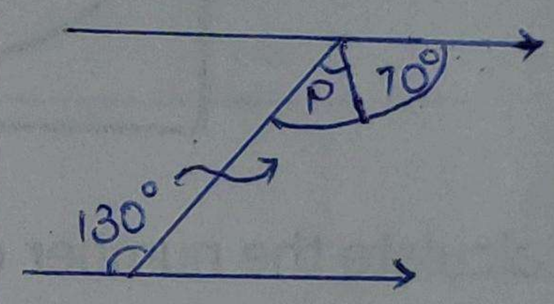
Find the size of;

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



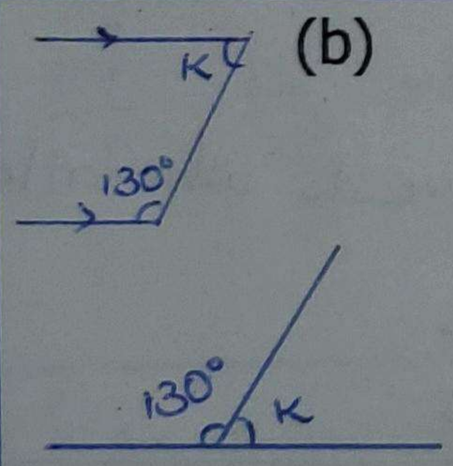
$p + 70° = 130°$
$p + 70° - 70° = 130° - 70°$
$p + 0 = 60°$
$p = 60°$

OR



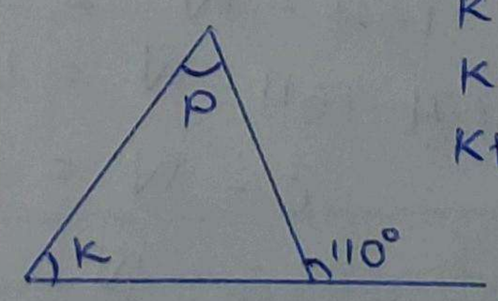
$p + 70° = 130°$
$p + 70° - 70° = 130° - 70°$
$p + 0 = 60°$
$p = 60°$

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



$k + 130° = 180°$
$k + 130° - 130° = 180° - 130°$
$k + 0 = 50°$
$k = 50°$

OR



$k + p = 110°$
$k + 60° = 110°$
$k + 60° - 60° = 110° - 60°$
$k + 0 = 50°$
$k = 50°$

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)*

Total mass

$40 \times 250g$

$10{,}000g$

$1000g = 1kg$

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

$10{,}000g = \left(\frac{1}{1000} \times 10000\right)kg$

$= \left(\frac{1}{1000} \times 10{,}000\right)kg$

$= 10kg$

OR

$1000g = 1kg$

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

$250g = \left(\frac{1}{\cancel{1000}_{4}} \times \cancel{250}^{1}\right)kg$

$= \frac{1}{4}kg$

Total mass

$\frac{1}{\cancel{4}_{1}}kg \times \cancel{40}^{10}$

$10kg$

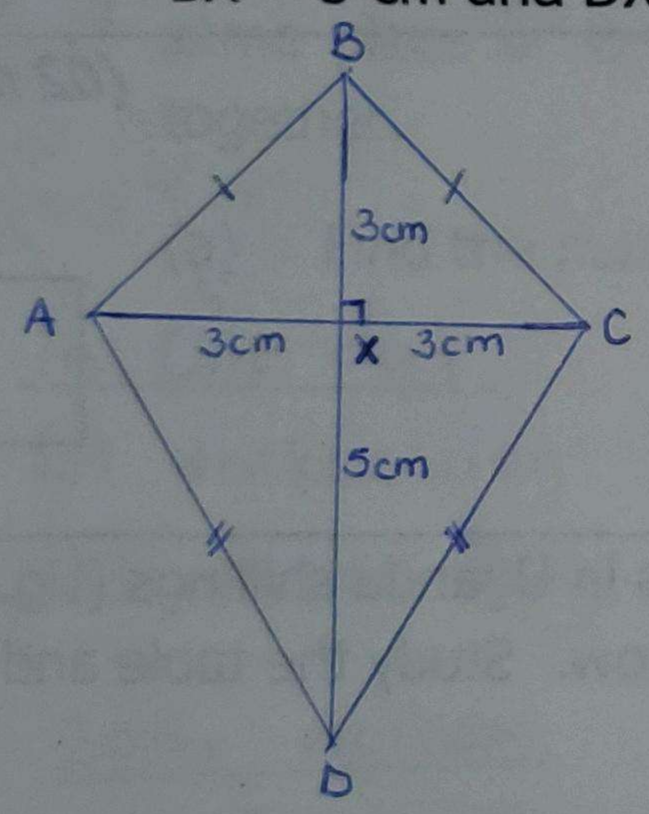
(b) A family uses a packet of salt every 5 days. Find the number of days the carton will last the family. *(02 marks)*

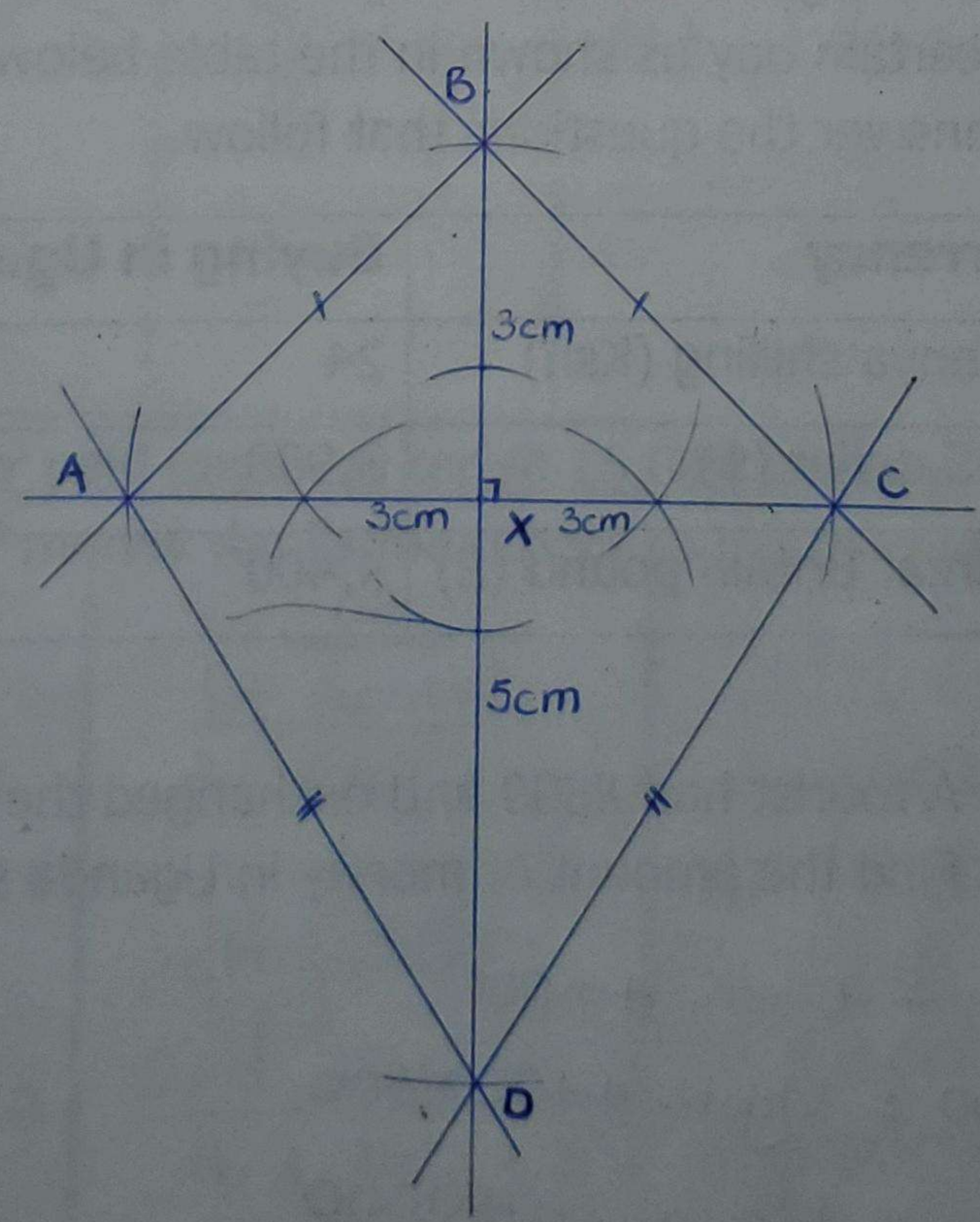
1 packet → 5 days

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).*





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 man's age be m

Man	daughter
m	¼m

6years ago

Man	daughter	Sum
m−6	¼m−6	48

$(m-6)+(\frac{1}{4}m-6) = 48$

$m+\frac{1}{4}m-6-6 = 48$

$m+\frac{m}{4}-12 = 48$

$m+\frac{m}{4}-12+12 = 48+12$

$m+\frac{m}{4}-0 = 60$

$(m\times4)+(\frac{m}{4}\times4) = 60\times4$

$4m+m = 240$

$\frac{5m}{5} = \frac{240}{5}$

$m = 48$

Daughter

¼m

$(\frac{1}{4}\times48)$yrs

12years

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

(m−6) years

(48−6) years

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. 4400

£600 = Ugsh. 4400×600

= Ugsh. 2,640,000

$\begin{array}{r} 44 \\ \times\ 6 \\ \hline 264 \end{array}$

(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 $200 to Ugsh.

$1 = Ugsh. 3900

$200 = Ugsh. 3900 × 200

= Ugsh. 780,000

Ugsh. 780,000 to Ksh.

$\left(\frac{\text{Ugsh. } 780{,}000}{\text{Ugsh. } 26}\right)$ k.sh.

30 000

26-1
+26-2
52
+26-3
78

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)

In One day

1st worker dag $\frac{1}{6}$

2nd worker dag $\frac{1}{3}$

Both Workers

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

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

$\frac{3}{6}$

$\frac{1}{2}$

Total number of days

$(1 \div \frac{1}{2})$ days

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

In one day

sh. 15,000 × 2

sh. 30,000

In two days

sh. 30,000 × 2

sh. 60,000

OR.

1st worker

sh. 15,000 × 2

sh. 30,000

2nd worker

sh. 15000 × 2

sh. 30,000

Total

sh. 30000 × 2

sh. 60,000

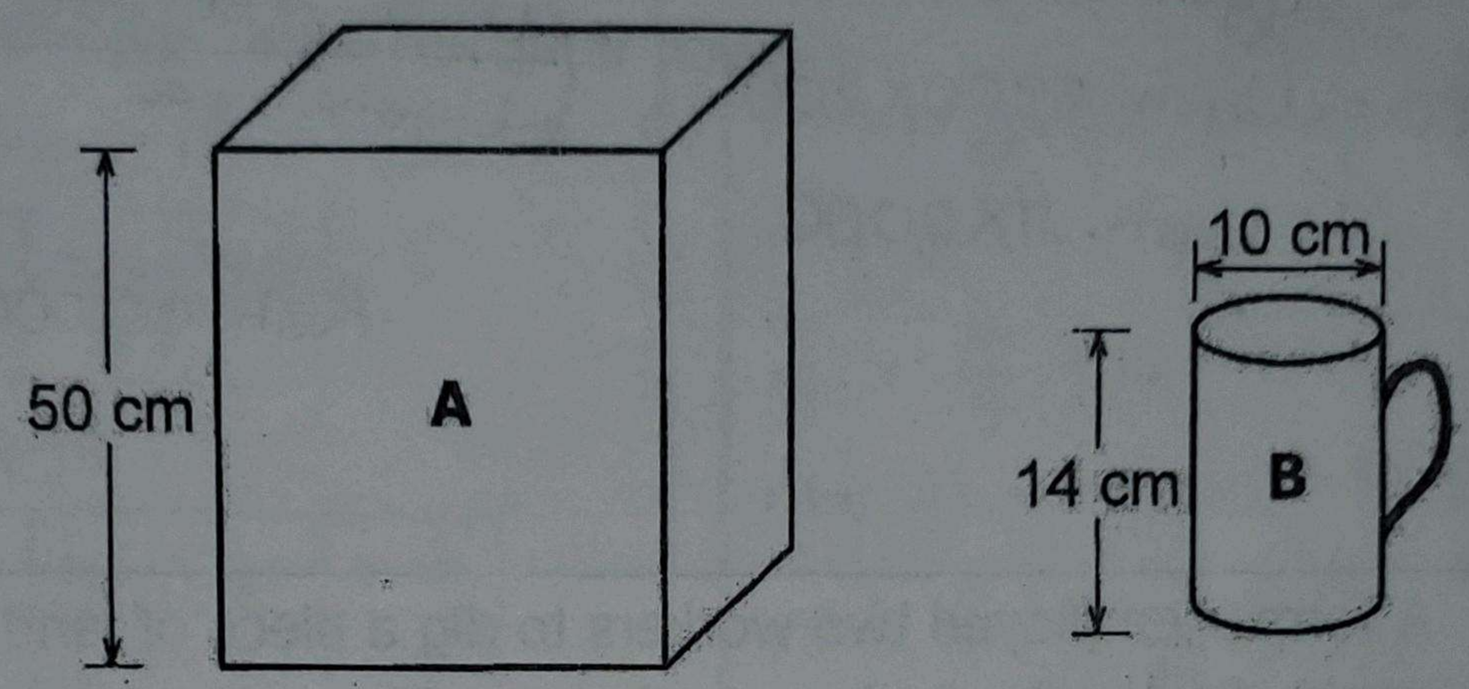
OR.

sh. 15000 × 2 × 2

sh. 15000 × 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 $= \pi r^2 h$.

$= \frac{\cancel{22}^{11}}{\cancel{7}_1} \times \frac{10cm}{\cancel{2}_1} \times \frac{\cancel{10}^{5}cm}{\cancel{2}_1} \times \cancel{14}^{2}cm$

$= 110cm \times 10cm \times cm$

$= 1100cm^3$

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

Volume A $=$ 40 x Volume B

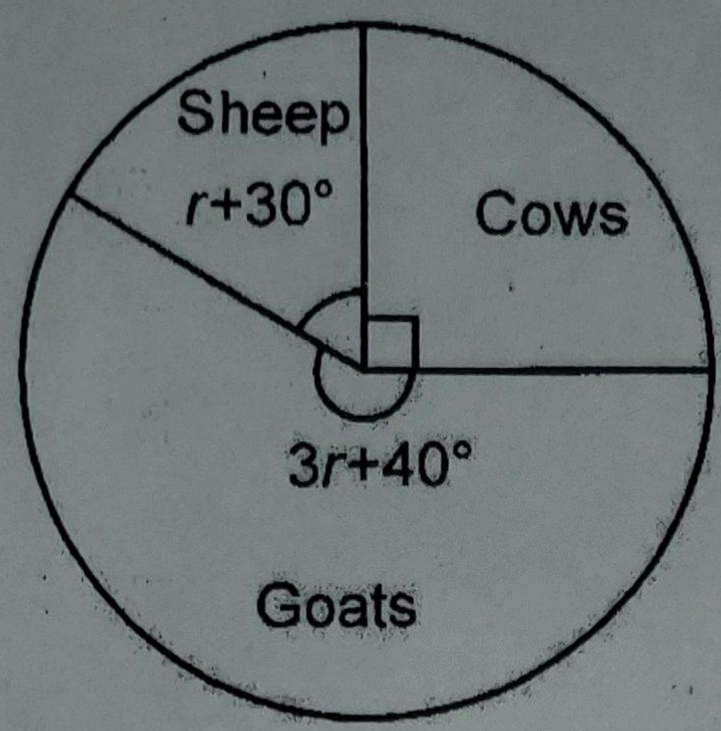
B.A x H $= 40 \times 1100 cm^3$

$\frac{B.A \times \cancel{50cm}^{1}}{\cancel{50cm}_1} = \frac{\cancel{40} \times \cancel{1100}^{220} cm \times cm \times \cancel{cm}}{\cancel{50cm}_1}$

$B.A = (4 \times 220) cm^2$

$B.A = 880 cm^2$

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)*

$3r+40^\circ + r + 30^\circ + 90^\circ = 360^\circ$

$3r + r + 40^\circ + 30^\circ + 90^\circ = 360^\circ$

$4r + 160^\circ = 360^\circ$

$4r + 160^\circ - 160^\circ = 360^\circ - 160^\circ$

$4r + 0 = 200^\circ$

$4r = 200^\circ$

$\frac{\cancel{4}^{1}r}{\cancel{4}_{1}} = \frac{\cancel{200}^{50}{}^\circ}{\cancel{4}_{1}}$

$r = 50^\circ$

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

Difference

Goats − sheep.

$(3r + 40^\circ) - (r + 30^\circ)$

$3r + 40^\circ - r - 30^\circ$

$3r - r + 40^\circ - 30^\circ$

$2r + 10^\circ$

$(2 \times 50^\circ) + 10^\circ$

$100^\circ + 10^\circ$

110°

$110^\circ \longrightarrow 11$ animals

$1^\circ \longrightarrow \frac{11}{110}$ animals

$360^\circ \longrightarrow \left(\frac{\cancel{11}^{1}}{\cancel{110}_{1}} \times 36\cancel{0}^\circ\right)$ animals

36 animals

END