



UGANDA NATIONAL EXAMINATIONS BOARD

PRIMARY LEAVING EXAMINATION

2023

MATHEMATICS

Time Allowed: 2 hours 30 minutes

15/11/2023

Eddie The

Random No.						Personal No.		

Candidate's Name: Marking guide

Candidate's Signature: This is NOT a national marking guide.

District ID No. 0001 Personal private opinions.

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	10	
6 - 10	10	
11 - 15	10	
16 - 20	10	
21 - 22	10	
23 - 24	09	
25 - 26	08	
27 - 28	10	
29 - 30	12	
31 - 32	11	
TOTAL	100	

SECTION A: 40 MARKS

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

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

Operations on whole numbers
K
P.2

1. Work out:

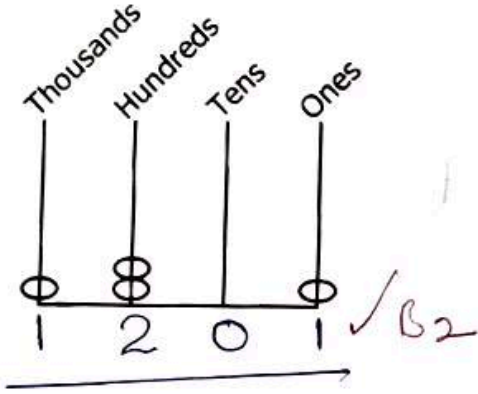
$$63 + 54 = 117 \quad \checkmark B_2$$

$$\begin{array}{r} 63 \\ + 54 \\ \hline 117 \end{array} \quad \checkmark B_2$$

$$\begin{array}{r} 60 + 3 \\ + 50 + 4 \\ \hline 110 + 7 \\ = 117 \end{array} \quad \checkmark B_2$$

Whole numbers
K
P.3

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

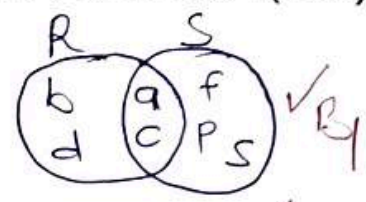


Set concepts
C
P.5

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

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

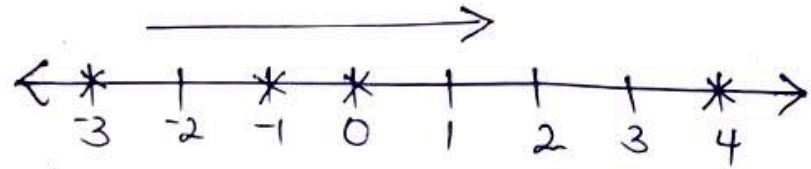
$$n(R \cup S) = 7 \quad \checkmark B_1$$



$$n(R \cup S) = 7 \quad \checkmark B_1$$

Integers
P.5
C

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



In ascending order;
-3, -1, 0 and 4 $\checkmark B_2$

Integers
C
P.7

5. A training for scouts started on a Wednesday and took 30 days. Find the day of the week on which the training ended. (11)

Wed + days taken = (mod 7) We use a calendar

① $3 + 29 = 32 \div 7 (\text{mod } 7)$ W T F S S M T

$3 + 29 = 4 \text{ rem } 4 (\text{mod } 7)$ 1 2 3 4 5 6 7

$= 4 (\text{mod } 7)$ 8 9 10 11 12 13 14

② $2 + 30 = 32 \div 7 (\text{mod } 7)$ 15 16 17 18 19 20 21

$= 4 \text{ rem } 4 (\text{mod } 7)$ 22 23 24 25 26 27 28

$= 4 (\text{mod } 7)$ 29 30

∴ The training ended on Thursday!

10

LMC
C
P.5

6. Change 750 millilitres into litres.

1L = 1000 ml

1ml = $\frac{1}{1000}$ L

750ml = $(\frac{1}{1000} \times 750)$ L

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

= 0.75 Litres. A1

OR

= $\frac{3}{4}$ litres

Operations on
whole numbers.
C
P.7

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

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

= $16 + 9$

= 25 A1

Time
C
P.7

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

ET = 1:20 p.m.
+ 12:00 hours
13:20 hours

ST = 13:20
- 2:15
11:05

11:05 a.m. A1

∴ It started at 11:05 a.m.

(i) Use of a number line

(iii) Use of regrouping

(iv) Use of a clock face.

Algebra
C
P.7

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

Values of P are;

$P = \{3, 2, 1, 0, -1, -2, \dots\}$ B2

Patterns and sequence

P.7

10. Find the next number in the sequence:

1, 8, 27, 64, ..., 125 ✓ B1
 $1 \times 1 \times 1$ $2 \times 2 \times 2$ $3 \times 3 \times 3$ $4 \times 4 \times 4$ $5 \times 5 \times 5$ ✓ B1

10

Whole numbers

P.7

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

3	14	2
3	4	1
3	1	1
	0	

✓ m1

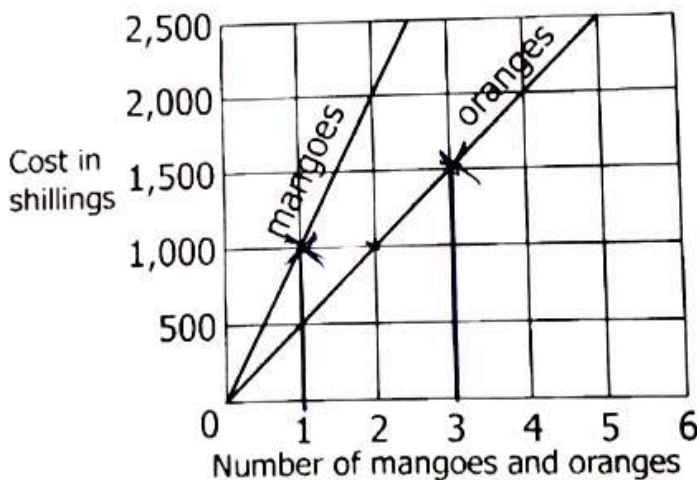
000 000 000 000 00 ✓
 \rightarrow
 $= 112_{\text{three}}$ ✓

$14 = 112_{\text{three}}$ ✓ A1

Data handling

P.6

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. 1000 + sh. 1000 + sh. 1500) ✓ m1
 $= \text{sh } 2,500$ ✓ A1

Total cost was/is sh 3500

2 mangoes + 3 oranges ✓
 $(2 \times \text{sh } 1000) + (3 \times \text{sh } 500)$
 $\text{sh } 2000 + \text{sh } 1500$ ✓ m1
 $= \text{sh } 3500$ ✓ A1

Patterns and Sequences
C
P.7

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

Apply finite system.
A number is divisible by 9 if all its digits sum to a multiple of 9.

$$7+8+t = \text{--- (finite 9)}$$

of finite 9 = 9, 18, 27, 36, ...

$$7+8+t = 18 \quad \checkmark$$

$$15+t = 18$$

$$15-15+t = 18-15$$

$$t = 3 \quad \checkmark$$

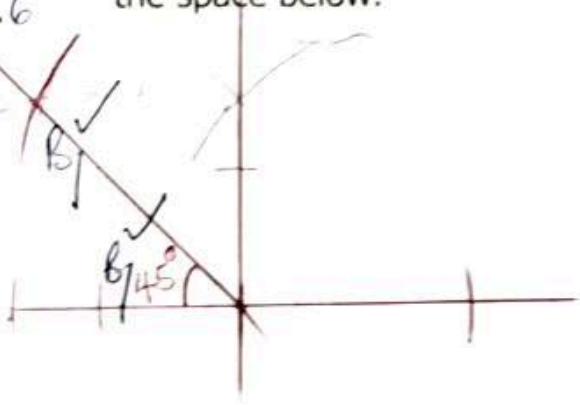
$$\therefore t = 3 \quad \checkmark$$

- ① All digits sum to a multiple of 9.
- If t = 1
① $7+8+1 = 16 \times$
② $7+8+2 = 17 \times$
③ $7+8+3 = 18 \checkmark$
18 is a multiple of 9

LAG
A
P.6

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

① Use of 60°



Algebra
C
P.6

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

$$5q - 3q - 2r - r \quad \checkmark$$

$$2q - 3r \quad \checkmark$$

10

Data handling
C
P.5

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.

Av. $= \frac{(62+73+78)}{3} \text{ eggs} \quad \checkmark$

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

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

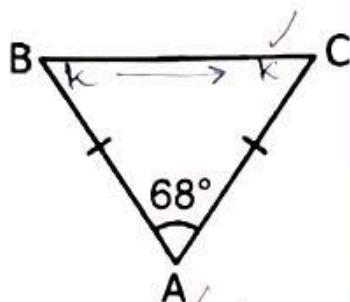
Money
C
P.5

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.

$$\begin{aligned} SP &= CP - \text{Loss} \\ &= \text{sh } 45,000 \\ &\quad - \text{sh } 1,500 \\ \hline &= \text{sh } 43,500 \end{aligned}$$

LAG
C
P.6

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



$$\begin{aligned} K + K + 68^\circ &= 180^\circ \\ 2K + 68^\circ &= 180^\circ \\ 2K + 68^\circ - 68^\circ &= 180^\circ - 68^\circ \\ 2K &= 112^\circ \end{aligned}$$

$$\begin{aligned} \frac{2K}{2} &= \frac{112^\circ}{2} \\ K &= 56^\circ \end{aligned}$$

$$\begin{aligned} \text{Since } \angle B &= \angle C \\ \angle B &= \frac{180^\circ - 68^\circ}{2} \\ &= \frac{112^\circ}{2} \\ &= 56^\circ \end{aligned}$$

$$\begin{aligned} \text{III} \\ 180^\circ - 68^\circ &= 112^\circ \\ \text{Base angles are equal.} \\ \frac{112^\circ}{2} &= 56^\circ \end{aligned}$$

LMC
P.6
C

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

1 hour take 1 complete revolution.

1 complete revolution = Circumference

$$\begin{aligned} C &= \pi D \\ \pi D &= 88 \text{ cm} \\ \frac{22}{7} \times D &= 88 \text{ cm} \end{aligned}$$

$$\begin{aligned} \frac{22}{7} \times \frac{1}{22} \times D &= \frac{88 \text{ cm} \times 7}{22} \\ D &= 28 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{Radius} &= \text{Minute hand} \\ &= \frac{28 \text{ cm}}{2} \\ &= 14 \text{ cm} \end{aligned}$$

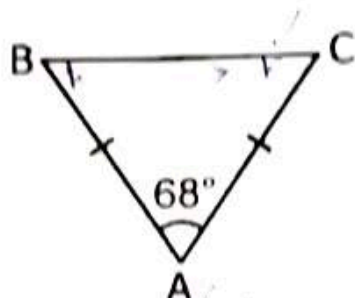
$$\begin{aligned} \text{II} \quad C &= 2\pi r \\ 2 \times \frac{22}{7} \times r &= 88 \text{ cm} \\ \frac{7}{7} \times \frac{44}{2} \times r &= 88 \text{ cm} \times \frac{7}{44} \\ r &= 2 \text{ cm} \times 7 \\ r &= 14 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{III} \quad D &= C \div \pi \\ &= 88 \text{ cm} \div \frac{22}{7} \\ &= 88 \text{ cm} \times \frac{7}{22} \\ &= 28 \text{ cm} \\ R &= 28 \text{ cm} \div 2 \\ &= 14 \text{ cm} \end{aligned}$$

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.

$$\begin{aligned} \text{S.P.} &= \text{C.P.} - \text{Loss} \\ &= \text{sh } 45,000 - 1,500 \\ &= \text{sh } 43,500 \end{aligned}$$

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



$$\begin{aligned} K + K + 68^\circ &= 180^\circ \\ 2K + 68^\circ &= 180^\circ \\ 2K + 68^\circ - 68^\circ &= 180^\circ - 68^\circ \\ 2K &= 112^\circ \end{aligned}$$

$$\begin{aligned} \frac{112^\circ}{2} \\ K &= 56^\circ \end{aligned}$$

$$\begin{aligned} \text{(ii) Since } \angle B &= \angle C \\ \angle B &= 120^\circ - 68^\circ \\ &= 56^\circ \end{aligned}$$

$$\begin{aligned} \text{(iii)} \\ 120^\circ - 68^\circ \\ &= 52^\circ \end{aligned}$$

Base angles are equal.

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

Then take 1 complete revolution.

1 complete revolution = Circumference

$$C = 2\pi r$$

$$2\pi r = 88 \text{ cm}$$

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

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

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

$$\begin{aligned} \text{Radius} &= \text{Minute hand} \\ &= \frac{28 \text{ cm}}{2} \\ &= 14 \text{ cm} \end{aligned}$$

$$\text{(ii) } C = 2\pi r$$

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

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

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

$$r = 14 \text{ cm}$$

$$\text{(iii) } A = C \div \pi$$

$$88 \text{ cm} \div \frac{22}{7}$$

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

$$= 28 \text{ cm}$$

$$r = \frac{28 \text{ cm}}{2} = 14 \text{ cm}$$

Fractions
c
p.6

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?

①

1st

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

$$= 20 \times 4\%$$

$$= 80\% \checkmark$$

②

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

$$= 18 \times 5\%$$

$$= 90\% \checkmark$$

10

The pupil performed better in 2nd term Mathematics test. \checkmark B1

①

Use of LCM method

②

Ratios

③

Equivalent fractions.

④

Use of degrees

Marks for each question are indicated in brackets.

Fractions
C 21.
P.6

(a) Simplify:

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

(03 marks)

$$\begin{aligned} \frac{1}{2} - \frac{1}{4} \div \frac{4}{5} &= \left(\frac{1}{2} \times \frac{5}{4} \right) - \left(\frac{5}{16} \right) \\ &= \frac{5}{8} - \frac{5}{16} \\ &= \frac{10}{16} - \frac{5}{16} \\ &= \frac{5}{16} \end{aligned}$$

(b) Work out:

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

(02 marks)

$$\begin{aligned} \frac{27}{100} \times \frac{12}{10} \div \frac{9}{10} &= \frac{27}{100} \times \frac{12}{10} \times \frac{10}{9} \\ &= \frac{36}{100} \\ &= 0.36 \end{aligned}$$

Distance Time and
C 22.
P.6

An athlete covered 400 metres in 48 seconds. Calculate the speed of the athlete in kilometres per hour.

(04 marks)

$$\begin{aligned} \text{Speed} &= \frac{400}{1000} \text{ km} \div \frac{48}{3600} \text{ hours} \\ &= \frac{4}{10} \text{ km} \times \frac{3600}{48} \text{ hours} \\ &= (10 \times 3) \text{ km/h} \\ &= 30 \text{ km/h} \end{aligned}$$

speed in km/h

$$\begin{aligned} &= \left(\frac{25}{3} \text{ m} \div \frac{1000}{3600} \text{ sec} \right) \text{ km/h} \\ &= \left(\frac{25}{3} \text{ m} \times \frac{3600}{1000} \text{ sec} \right) \text{ km/h} \\ &= (5 \times 6) \text{ km/h} \\ &= 30 \text{ km/h} \end{aligned}$$

$$\begin{aligned} \text{Speed} &= \frac{400}{48} \text{ m/sec} \\ &= \frac{25}{3} \text{ m/sec} \end{aligned}$$

1 km = 1000 m
1 h = 3600 sec

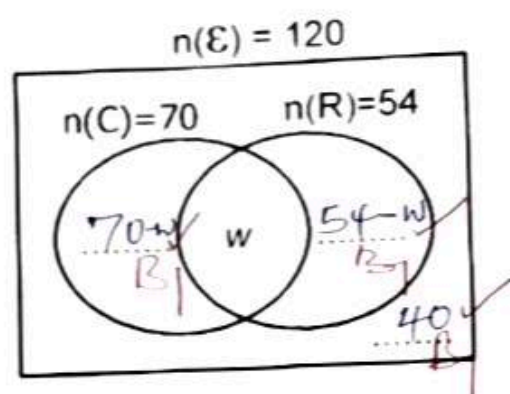
09

set counts

- C. 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.

P.6

- (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)

$$\begin{aligned}
 70 - w + w + 54 - w + 40 &= 120 \quad \checkmark m \\
 70 + 54 + 40 - w &= 120 \\
 164 - w &= 120 \\
 164 - 164 - w &= 120 - 164 \\
 -w &= -44 \\
 w &= 44 \quad \checkmark A1
 \end{aligned}$$

44 guests attended both.

Patterns and Sequences
C
P.5

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.

$$\begin{aligned}
 F_{126} &= \{1, 2, 3, 6, 7, 9, 14, 18, 21, 42, 63, 126\} \quad \checkmark \\
 F_{90} &= \{1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90\} \quad \checkmark \\
 F_{72} &= \{1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72\} \quad \checkmark B1 \\
 CF &= \{1, 2, 3, 6, 9, 18\} \quad \checkmark B1 \\
 GCF &= 18 \quad \checkmark A1
 \end{aligned}$$

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

$$\begin{aligned}
 &= \frac{126}{18} \text{ groups} \quad \checkmark m \\
 &= 7 \text{ groups} \quad \checkmark A1
 \end{aligned}$$

(03 marks)

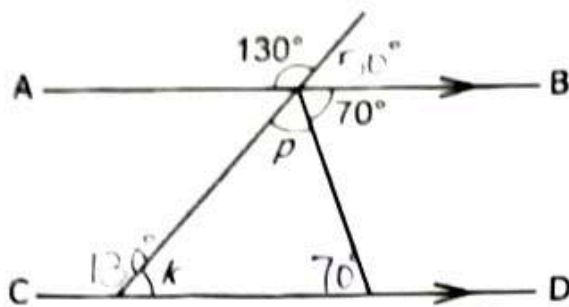
21	26	90	72
3	6	3	45
3	21	15	12
7	5	4	

$$\begin{aligned}
 GCF &= 2 \times 3 \times 3 \\
 &= 18 \quad \checkmark A1
 \end{aligned}$$

10

Geometric construction
C
p.7

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. ①

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

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

$$p = 60^\circ \checkmark \text{A7}$$

①

$$p + 70^\circ + 50^\circ = 180^\circ \checkmark$$

$$p + 120^\circ = 180^\circ \quad (02 \text{ marks})$$

$$p + 120^\circ - 120^\circ = 180^\circ - 120^\circ$$

$$p = 60^\circ \checkmark$$

- (b) angle k. ①

$$p + k + 70^\circ = 180^\circ \checkmark$$

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

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

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

$$k = 50^\circ \checkmark \text{A7}$$

①

$$k + 130^\circ = 180^\circ \checkmark \quad (02 \text{ marks})$$

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

$$k = 50^\circ \checkmark$$

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.

$$1 \text{ Kg} = 1000 \text{ g}$$

$$\text{Mass of 40 packets} = \left(\frac{40 \times 250}{1000} \right) \text{ Kg}$$

$$= 10 \text{ Kg} \checkmark \text{A7}$$

(02 marks)

$$40 \times 250 \text{ g}$$

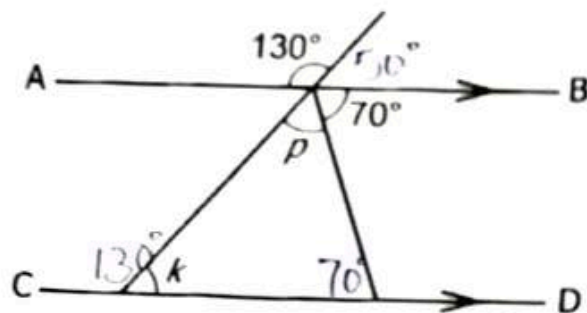
$$= 10000 \text{ g} \checkmark \text{B7}$$

$$1 \text{ Kg} = 1000 \text{ g}$$

$$\text{Mass of 40 packets} = \left(\frac{10000 \text{ g}}{1000 \text{ g}} \right) \text{ Kg}$$

$$= 10 \text{ Kg} \checkmark \text{B7}$$

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. ①

$$\begin{aligned} p + 70^\circ &= 130^\circ \checkmark \\ p + 70^\circ - 70^\circ &= 130^\circ - 70^\circ \\ p &= 60^\circ \checkmark \end{aligned}$$

①

$$\begin{aligned} p + 70^\circ + 50^\circ &= 180^\circ \checkmark \\ p + 120^\circ &= 180^\circ \quad (02 \text{ marks}) \\ p + 120^\circ - 120^\circ &= 180^\circ - 120^\circ \\ p &= 60^\circ \checkmark \end{aligned}$$

- (b) angle k. ②

$$\begin{aligned} p + k + 70^\circ &= 180^\circ \checkmark \\ 60^\circ + k + 70^\circ &= 180^\circ \\ k + 130^\circ &= 180^\circ \\ k + 130^\circ - 130^\circ &= 180^\circ - 130^\circ \\ k &= 50^\circ \checkmark \end{aligned}$$

②

$$\begin{aligned} k + 130^\circ &= 180^\circ \checkmark \quad (02 \text{ marks}) \\ k + 130^\circ - 130^\circ &= 180^\circ - 130^\circ \\ k &= 50^\circ \checkmark \end{aligned}$$

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.

$$\begin{aligned} 1 \text{ Kg} &= 1000 \text{ g} \\ \text{Mass of 40 packets} &= \left(\frac{40 \times 250}{1000} \right) \text{ Kg} \\ &= 10 \text{ Kg} \checkmark \end{aligned}$$

(02 marks)

$$\begin{aligned} 40 \times 250 \text{ g} &= 10000 \text{ g} \checkmark \\ 1 \text{ Kg} &= 1000 \text{ g} \\ \text{Mass of 40 packets} &= \left(\frac{10000 \text{ g}}{1000 \text{ g}} \right) \text{ Kg} \\ &= 10 \text{ Kg} \checkmark \end{aligned}$$

- (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 covers 5 days ✓
 40 packets cover 5×40 days ✓
 $= 200$ days ✓ #1

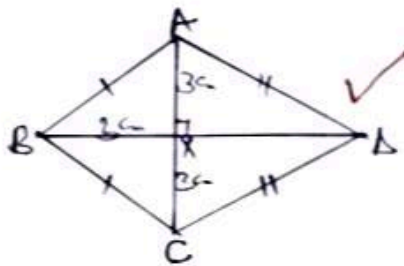
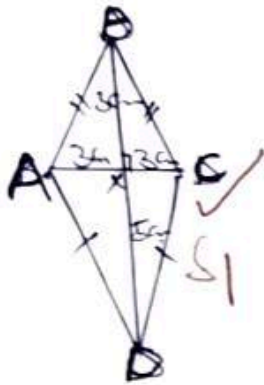
04

08

Geometric Construction

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.



L, L, P, J

05

Algebra 28.
P. 1
A

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

Find; Let the daughter's age be k .

(03 marks)

(a) the age of the daughter now

Time	daughter	Man	Sum
Now	k	$4k$	
6 yrs ago	$k-6$	$4k-6$	48

$$k + 4k - 6 - 6 = 48$$

$$5k - 12 = 48$$

$$5k = 48 + 12$$

$$5k = 60$$

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

$$k = 12 \checkmark$$

Daughter is 12 yrs old

(b) the age of the man six years ago.

(02 marks)

$$4k - 6$$

$$(4 \times 12) - 6 \checkmark$$

$$48 - 6$$

$$= 42 \text{ yrs} \checkmark$$

10

Money 29.
P. 6
C

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.

Amount = Ug.sh $4400 \times 600 \checkmark$ (02 marks)

= Ug.sh $2,640,000 \checkmark$

- (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)

$$\begin{aligned} \text{US\$ 1 costs Ug sh. 2900} \quad \checkmark m \\ \text{US\$ 200 cost Ug sh. } 2900 \times 200 \\ = \text{Ug sh. } 780,000 \quad \checkmark A \end{aligned}$$

$$\text{K sh 1 costs Ug sh. 26}$$

$$\text{Ug sh. } 780,000 \text{ cost } \frac{\text{Ug sh. } 780,000}{\text{Ug sh. } 26} \quad \checkmark m$$

$$= \text{K sh. } 30,000 \quad \checkmark A$$

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)

$$\begin{aligned} \text{In 1 day} & \quad \text{Working at the same rate} \\ \text{one digger } & \frac{1}{6} \quad \checkmark B \\ \text{second digger } & \frac{1}{3} \\ \text{Altogether } & \frac{1}{6} + \frac{1}{3} = \frac{1+2}{6} = \frac{3}{6} = \frac{1}{2} \quad \checkmark A \\ & \quad 1 \div \frac{1}{2} = 1 \times \frac{2}{1} = 2 \text{ days} \quad \checkmark A \end{aligned}$$

- (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.

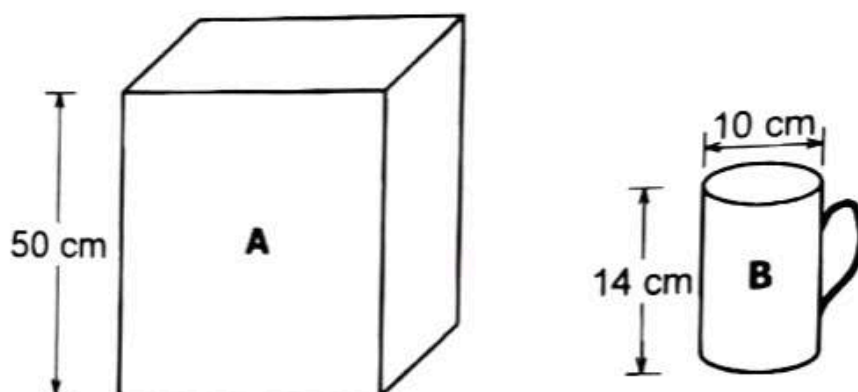
(02 marks)

$$\begin{aligned} \text{1 day } & \text{Sh } 15,000 \times 2 \text{ workers} \\ & = \text{Sh } 30,000 \quad \checkmark m \end{aligned}$$

$$\begin{aligned} \text{2 days } & \text{Sh } 30,000 \times 2 \\ & = \text{Sh } 60,000 \quad \checkmark A \end{aligned}$$

LMC
C
P.7

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)

$$\begin{aligned}
 \text{Volume} &= \text{Base area} \times \text{Height} \\
 &= \pi r^2 \times h \\
 &= \frac{22}{7} \times 5\text{cm} \times 5\text{cm} \times 14\text{cm} \checkmark m \\
 &= 44 \times 25\text{cm}^3 \\
 &= 1100\text{cm}^3 \checkmark A1
 \end{aligned}$$

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

$$\text{Volume of A} = \text{Volume of 40 cups of B.}$$

$$\text{Base area} \times \text{Height} = 1100\text{cm}^3 \times 40 \checkmark B1$$

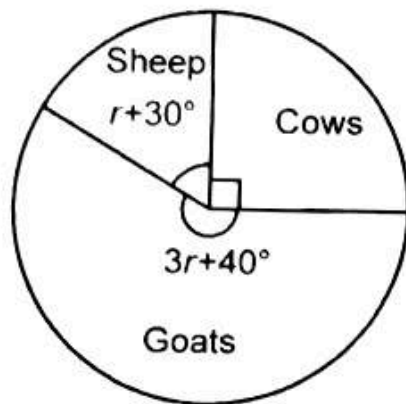
$$\frac{\text{Base area} \times 50\text{cm}}{50\text{cm}} = \frac{1100\text{cm}^3 \times 40}{50\text{cm}} \checkmark m$$

$$\text{Base area} = 880\text{cm}^2 \checkmark A1$$

05

Data handling

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



- (a) Find the value of r .

(02 marks)

$$\begin{aligned}
 3r + 40^\circ + r + 30^\circ + 90^\circ &= 360^\circ \checkmark m \\
 3r + r + 40^\circ + 30^\circ + 90^\circ &= 360^\circ \\
 4r + 160^\circ &= 360^\circ \\
 4r + 160^\circ - 160^\circ &= 360^\circ - 160^\circ \\
 4r &= 200^\circ \\
 \frac{4r}{4} &= \frac{200^\circ}{4} \\
 r &= 50^\circ \checkmark A1
 \end{aligned}$$

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

$$\begin{aligned}
 \text{Goats} \\
 3r + 40^\circ \\
 (3 \times 50^\circ) + 40^\circ \\
 150^\circ + 40^\circ \\
 = 190^\circ \checkmark B1
 \end{aligned}$$

$$\begin{aligned}
 \text{Sheep} \\
 r + 30^\circ \\
 = 50^\circ + 30^\circ \\
 = 80^\circ \checkmark
 \end{aligned}$$

$$\begin{aligned}
 \text{Difference} \\
 190^\circ - 80^\circ \checkmark B1 \\
 = 110^\circ \text{ more } \checkmark B1
 \end{aligned}$$

Let the total be y .

$$110^\circ \text{ of } y = 11 \checkmark m$$

$$\frac{110}{360} \times y = 11 \times \frac{36}{1}$$

$$y = 36 \text{ more goats on the farm than sheep.}$$

15

END

11

06