UGANDA NATIONAL EXAMINATIONS BOARD

# PRIMARY LEAVING EXAMINATION

## 2023

MATHEMATICS

***Time Allowed: 2 hours 30 minutes***

| Random No. | | | | | | Personal No. | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

**Candidate's Name:** SSEBALU ISMAEL'S Marking guide

**Candidate's Signature:** [redacted] 0774006787 / 0726609878

**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** | | |



**Turn Over**

## SECTION A: 40 MARKS

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

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

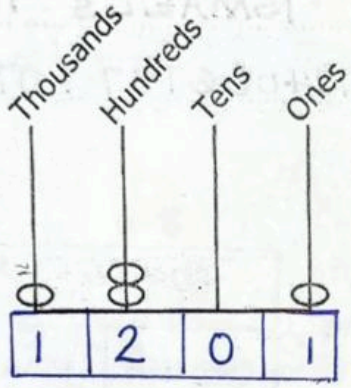
1. Work out: 63 + 54

$$\begin{array}{r} {}^{1}63 \\ +\,54 \\ \hline 117 \end{array}$$

3 + 4 = 7

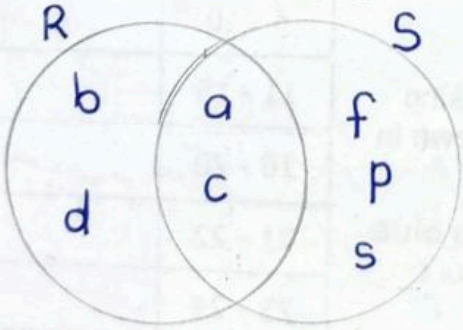
6 + 5 = 11

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).

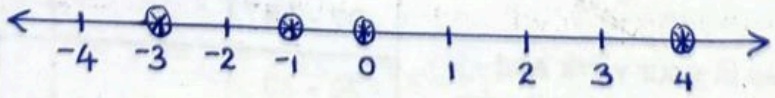



R ∪ Ø

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.




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 | Mon | Tue | Wed | Thur | Fri | Sat |
|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 |

$33 \div 7 = 4 \text{ rem } 5$

Wed + 30 = ___ (mod 7)

3 + 30 = ___ (mod 7)

33 = ___ (mod 7)

33 = 5 (mod 7)

3 + 30 = 5 (mod 7)

5 rep. Friday.

It will end on Friday.

6. Change 750 millilitres into litres.

1000 ml = 1 litre

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

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

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

750 ml = 0·75 litres

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

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

$4^2 + (3 \times 3 \times 1)$

$4^2 + 9$

$(4 \times 4) + 9$

$16 + 9$

$25$

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

Ending time in 24 hour system.

| Hrs | Min |
|---|---|
| 1 | 20 |
| +12 | 00 |
| 13 | 20 |

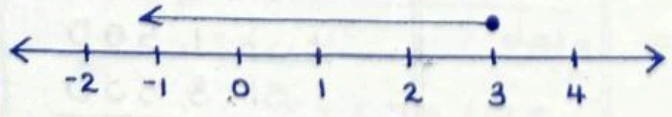
1320 hrs

Starting time = Ending time − Duration.

| Hrs | Min |
|---|---|
| 13 | 20 |
| − 2 | 15 |
| 11 | 05 a.m |

It began at 11:05 a.m

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




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

10. Find the next number in the sequence:

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

$1^3, 2^3, 3^3, 4^3, 5^3$

5 x 5 x 5

25 x 5

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

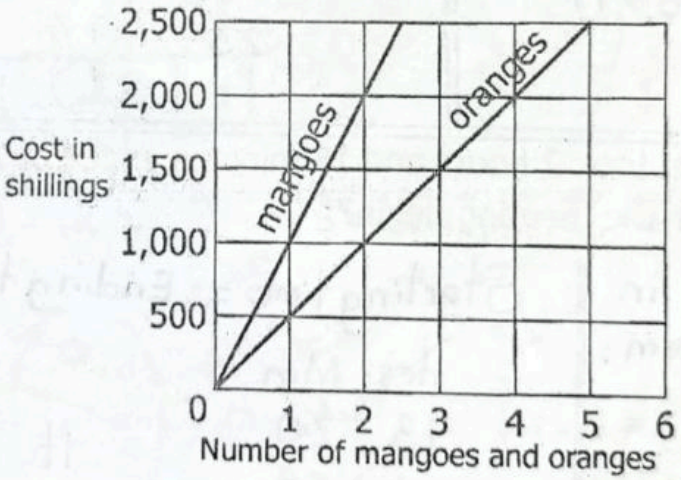
11. Change $14_{ten}$ to base three.

| Base | Number | Remainder |
|---|---|---|
| 3 | 14 | |
| 3 | 4 | 2 |
| 3 | 1 | 1 |
| | 0 | 1 |

$112_{three}$

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

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 cost Sh. 2,000
3 oranges cost Sh. 1,500

Total cost
Sh. 2,000
+ Sh. 1,500
Sh. 3,500

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

Multiples of 9

$1 \times 9 = 9$

$2 \times 9 = 18$

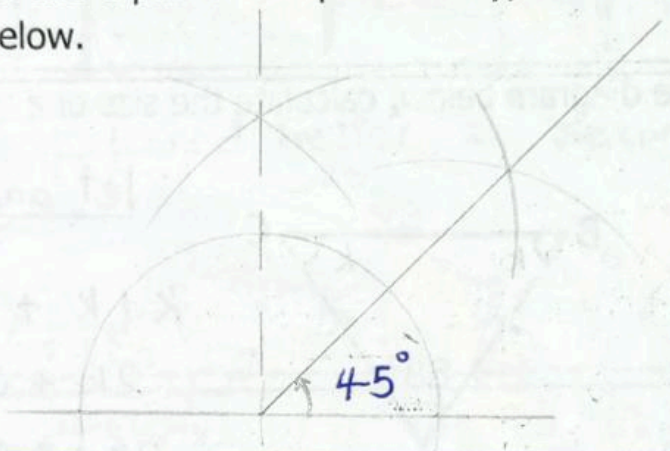
$7 + 8 + t = 18$

$15 + t = 18$

$15 - 15 + t = 18 - 15$

$t = 3$

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




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

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

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

$2q - 3r$

| -ve | +ve |
|---|---|
| -r | |
| -r | |
| -r | |

| -ve | +ve |
|---|---|
| -q | q |
| -q | q |
| -q | q |
| | q |
| | q |

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.

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

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

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

$$= \frac{71}{\cancel{213}}{\cancel{3}_1}$$

$= 71$ eggs

① 62 + 73 + 78 = 213

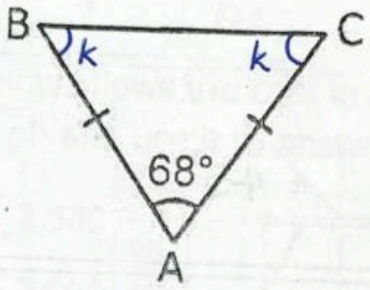
17. A businessman bought a watch at sh 45,000. He sold it and mad loss of sh 1,500. Find his selling price.

Selling Price = Buying price - Loss

$$\begin{array}{r} \text{Sh. } 4\overset{4}{5},000 \\ -\text{Sh } \quad 1,500 \\ \hline \text{Sh } 43,500 \end{array}$$

His selling price was sh 43,500

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




let angle ABC be k

$k + k + 68^\circ = 180^\circ$

$2k + 68^\circ = 180^\circ$

$2k + 68^\circ - 68^\circ = 180^\circ - 68^\circ$

$2k = 112^\circ$

$\frac{2k}{2} = \frac{112^\circ}{2}$

$k = 56^\circ$

Angle ABC = 56°

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

distance around → Circumference

Length of minute hand → radius

C = 88cm

$2\pi r = C$

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

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

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

r = 14cm

The minute hand is 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?

LCM of denominators

| | | |
|---|---|---|
| 2 | 20 | 25 |
| 2 | 10 | 25 |
| 5 | 5 | 25 |
| 5 | 1 | 5 |
| | 1 | 1 |

$2 \times 2 \times 5 \times 5$

$4 \times 25$

$100$

First term test

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

$\frac{20}{25_1} \times \overset{4}{\cancel{100}}$

$80$

Second term test

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

$\frac{18}{\cancel{20}_1} \times \overset{5}{\cancel{100}}$

$90$

He performed better in second term 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)*

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

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

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

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

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

$\frac{3}{16}$

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

$(0.27 \times 1.2) \div (0.9)$

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

$\frac{27}{100} \times \frac{12}{10} \times \frac{10}{9}$

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

$\frac{36}{100}$

$0.36$

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

Metres in km.

$1000m = 1km$

$1m = \frac{1}{1000} km$

$400m = 400 \times \frac{1}{1000} km$

$= \frac{4}{10} km$

Seconds in hours.

$3600 sec = 1 hour$

$1 sec = \frac{1}{3600} h$

$48 sec = \overset{4}{\cancel{48}} \times \frac{1}{\cancel{3600}\,300} h$

$= \frac{4}{300} h$

Speed in km/h

$S = D \div T$

$= \frac{4km}{10} \div \frac{4h}{300}$

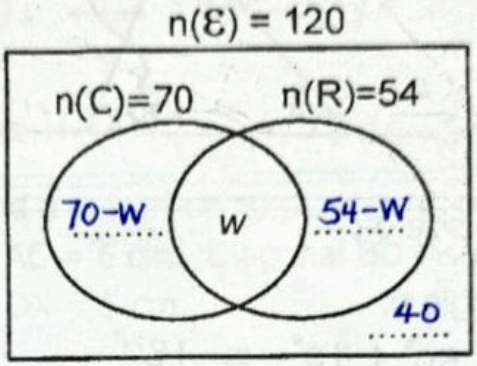
$= \frac{1}{\cancel{4}\,10} km \times \frac{\cancel{300}^{30}}{4h_{1}}$

$= 30 km/h$

The speed was 30 km/h

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)*

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

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

$164-w = 120$

$164-164-w = 120-164$

$-w = -44$

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

$w = 44$.

44 guests attended both.

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)*

Largest number → GCF

$GCF = PF_{126} \cap PF_{90} \cap PF_{72}$

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

$2 \times 3 \times 3$

18 pupils.

The largest number of pupils in each group is 18.

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

$\frac{126}{18}$

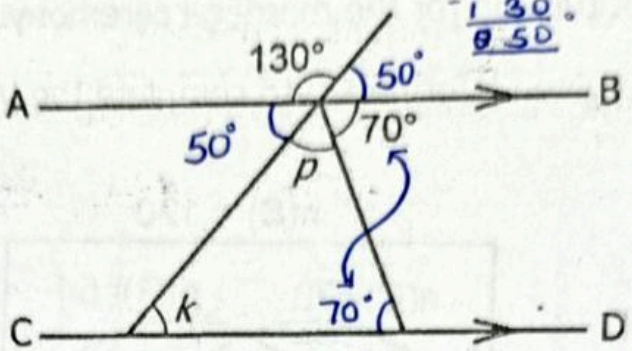
$\frac{126}{18}^{69}{}^{7}$

9,

7 groups were formed in primary five.

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

$180° - 130° = 50°$




Find the size of;

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

$50° + 70° = 120°$

$180° - 120° = 60°$

$p + 50° + 70° = 180°$

$p + 120° = 180°$

$p + 120° - 120° = 180° - 120°$

$p = 60°$

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

$K + P + 70° = 180°$

$K + 60° + 70° = 180°$

$K + 130° = 180°$

$K + 130° - 130° = 180° - 130°$

$K = 50°$

$60° + 70° = 130°$

$180° - 130° = 50°$

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 weighs 250 grammes

40 packets weigh $40 \times 250$ grammes

40 packets weigh 10000 grammes

Mass in kg

$1000g = 1kg$

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

$10.000g = 10000 \times \frac{1}{1000} kg$

$= 10kg$

Total mass is 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

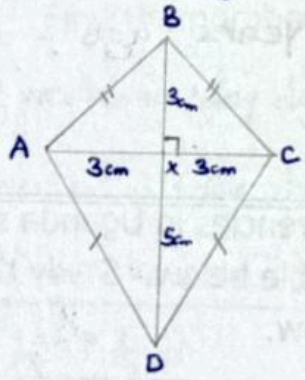
40 packets ⟷ (40 x 5) days

40 packets ⟷ 200 days

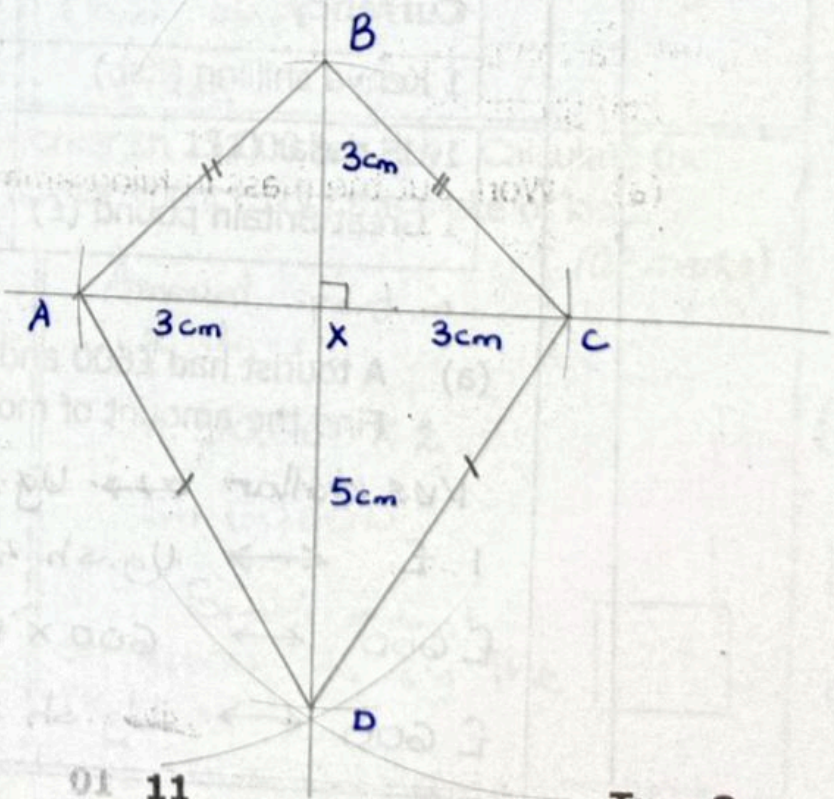
A carton will last for 200 days

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 shape.



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 daughter's age be k

| Name | Daughter | Man | Sum |
|---|---|---|---|
| Age Now | k | 4k | |
| 6 years ago | k-6 | 4k-6 | 48 |

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

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

$5k-12 = 48$

$5k-12+12 = 48+12$

$5k = 60$

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

$k = 12$

The daughter is 12 years old.

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

$4k-6$

$(4\times12)-6$

$48-6$

$42$

The man was 42 years old six years ago.

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 ↔ Ug.sh 3900

1 £ ↔ Ug.sh 4,400

£600 ↔ 600 × Ug.sh 4,400

£600 ↔ Ug.sh 2,640,000

The tourist got Ug.sh 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)

Dollars to Ug.sh

1 $ ⟷ Ug.sh 3,900

200 $ ⟷ 200 × Ug.sh 3900

200 $ ⟷ Ug.sh. 780,000

Ug.sh to Kenya shillings

K.sh 1

Ug.sh 26 ⟷ 1 k.sh

Ug.sh 1 ⟷ 1/26

Ug.sh 780,000 ⟷ 780,000 × 1/26

Ug.sh 780,000 ⟷ K.sh 30,000

He got 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)

First worker in 1day digs 1/6

2nd worker in 1day digs 1/3

Both workers in 1day

1/6 + 1/3

(1+2)/6

3/6 = 1/2

Total time

(1 ÷ 1/2) days

(1 × 2/1) days

2 days

They took 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)

Amount paid each day.

1 worker got Sh. 15000

2 workers got Sh. 15000 × 2

2 workers got sh. 30,000

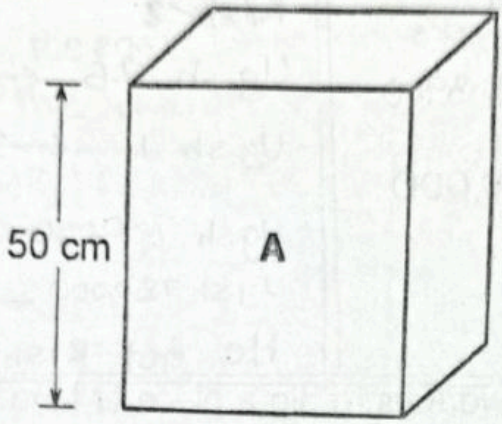
Amount spent in 2 days.

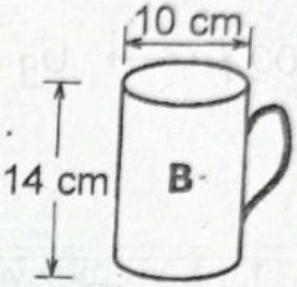
Sh. 30,000 × 2

Sh. 60,000.

The farmer spent sh. 60,000 to dig the piece of land.

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




$$\begin{array}{r} 22 \\ \times\ 5 \\ \hline 110 \end{array}$$

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

Vol = Base area x h

Vol = $\pi r^2 \times h$

Vol = $\frac{22}{7} \times \frac{10\text{cm}}{2} \times \frac{10\text{cm}}{2} \times 14\text{cm}$

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

Vol = $(22 \times 5\text{cm}) \times (5\text{cm} \times 2\text{cm})$

= $110\text{cm} \times 10\text{cm}^2$

= $1100\text{cm}^3$

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

Volume of container A

40 x Vol of B

$40 \times 1100\text{cm}^3$

$44000\text{cm}^3$

Base area of A.

Base area x h = Volume

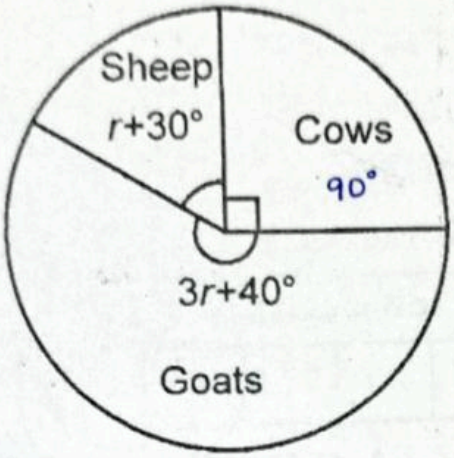
Base area x 50cm = $44000\text{cm}^3$

$\frac{\text{Base area} \times \cancel{50}\text{cm}}{\cancel{50}\text{cm}} = \frac{880}{\cancel{44000}\text{cm} \times \text{cm} \times \cancel{5}\text{cm}}{\cancel{50}\text{cm}}$

Base area = $880\text{cm} \times \text{cm}$

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

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)*

$3r + 40° + r + 30° + 90° = 360°$

$3r + r + 40° + 30° + 90° = 360°$

$4r + 160° = 360°$

$4r + 160° - 160° = 360° - 160°$

$4r = 200°$

$\frac{4r}{4_1} = \frac{\overset{50°}{\cancel{200}}}{4_1}$

$r = 50°$

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

Degrees for goats

$3r + 40°$

$(3 \times 50°) + 40°$

$150° + 40°$

$190°$

Degrees for sheep

$r + 30°$

$50° + 30°$

$80°$

More degrees for goats.

$190° - 80°$

$110°$.

Number of animals on the farm.

$110° \leftrightarrow 11$ animals

$1° \leftrightarrow \frac{11}{110}$ animals

$360° \leftrightarrow 360 \times \frac{11}{110}$ animals

$360° \leftrightarrow 36$ animals.

There are 36 animals on the farm.



END