

SECTION A: 40 MARKS

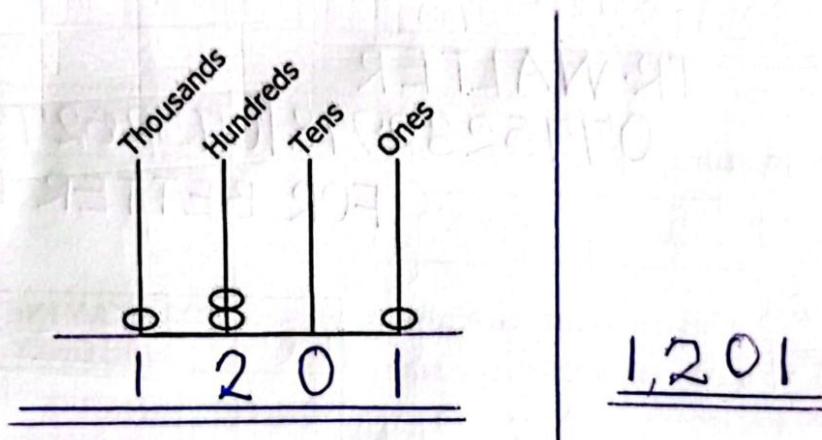
Answer **all** the questions in this section.

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

1. Work out: $63 + 54$

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

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



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

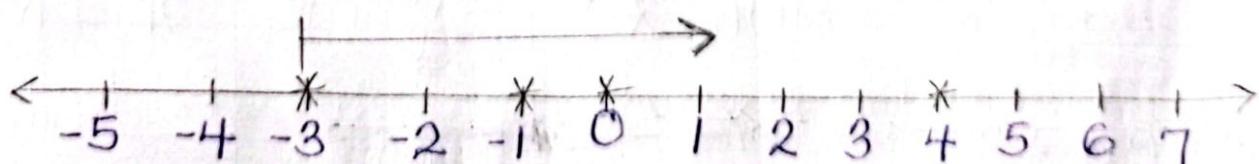
$$R = \{\textcircled{a}, b, \textcircled{c}, d\}$$

$$S = \{\textcircled{a}, f, p, \textcircled{c}, s\}$$

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

$$n(R \cup S) = 7$$

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



$$\text{In ascending order} = \{-3, -1, 0, 4\}$$

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

$$\text{Day} + \text{Days} = - \pmod{7}$$

$$\text{Wed} + 30 = - \pmod{7}$$

$$3 + 30 = \frac{33}{7} \text{ r } 5 \pmod{7}$$

$$5 \pmod{7}$$

\therefore The training



ended on Friday

6. Change 750 millilitres into litres.

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

$$750\text{ml} = \left(\frac{750\text{ml}}{1000\text{ml}}\right)\text{litres}$$

$$0.75\text{litres}$$

$$\therefore 750\text{ml} = 0.75\text{litres}$$

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

$$4^2 + 3^2 * 9^0$$

$$\cancel{16+10} \quad 16+9$$

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

$$\cancel{16} \quad 25$$

$$16 + (9 * 1)$$

$$\underline{\hspace{2cm}} \quad \underline{\hspace{2cm}}$$

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

$$\text{Starting time} = \text{Ending time} - \text{Duration}$$

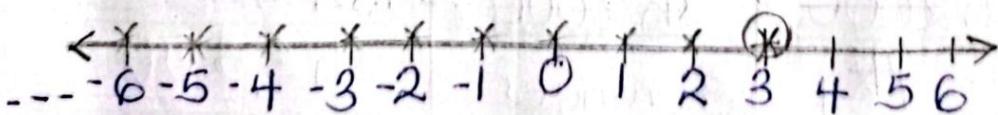
HRS	MIN
12	00
+1	20
13	20

$$13\text{ 20HRS}$$

HRS	MIN
13	20
-2	15
11	05

\therefore It began
at 11:05 a.m.

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

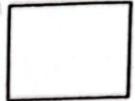


$$\text{P: P} = \{3, 2, 1, 0, \dots\}$$

10. Find the next number in the sequence:

$$\begin{array}{cccccc} 1, & 8, & 27, & 64, & \underline{125} \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 1^3 & 2^3 & 3^3 & 4^3 & 5^3 \end{array}$$

$(5 \times 5 \times 5)$



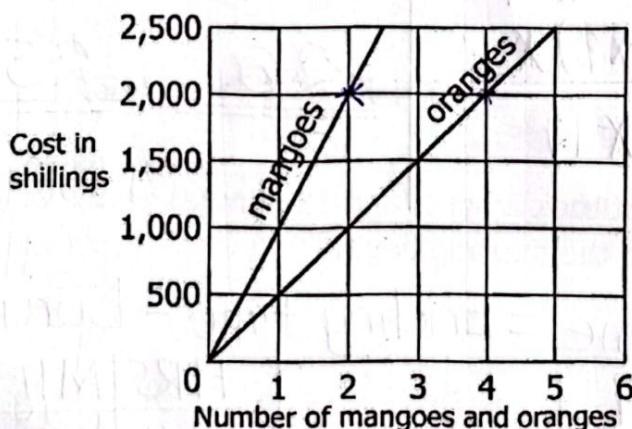
11. Change 14_{ten} to base three.

B	NO	R
3	14	2
3	4	1
3	1	↑

112 three

$$\therefore 14_{\text{ten}} = \underline{\underline{112 \text{ three}}}$$

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.

The cost of each

Mango	Orange	2 mangoes	Total cost
sh <u>2000</u>	sh <u>2000</u>	2 x sh 1000	sh 2,000
2,	+ ,	sh 2,000	+ sh 1,500
sh 1000	sh 500	3 oranges	sh 3,500
		3 x sh 500	
		sh 1500	

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

$$Mq = \{9, 18\} 27, 36 \dots 3$$

$$78t = 18$$

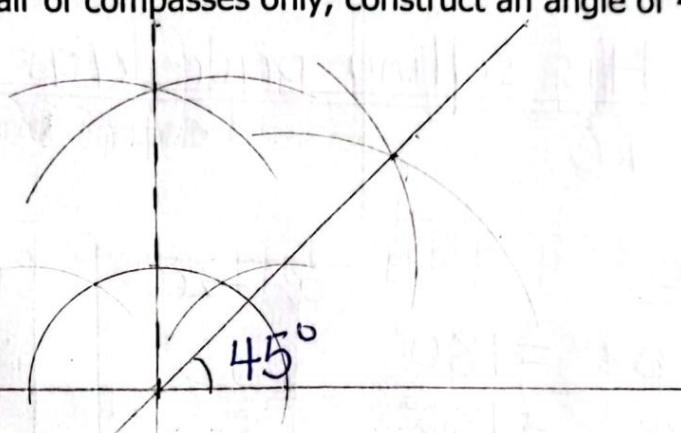
$$7 + 8 + t = 18$$

$$t + 15 = 18$$

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

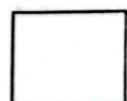
$$\underline{\underline{t = 3}}$$

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



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

$$\begin{aligned} & 5q - 2r - 3q - r \\ & (5q - 3q) - 2r - r \\ & \underline{\underline{2q - 3r}} \end{aligned}$$



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.

$$\text{Average} = \frac{\text{sum of data}}{\text{No of data}}$$

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

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

$$\text{Average} = \left(\frac{71}{3} \right) \cdot 5 \text{ eggs}$$

Turn Over

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.

$$\text{Selling price} = \text{Buying price} - \text{Loss}$$

$$\begin{array}{r} \text{sh } 45,000 \\ - \text{sh } 1,500 \\ \hline \text{sh } 43,500 \end{array}$$

\therefore His selling price was sh 43,500

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

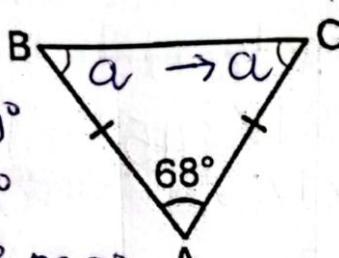
$$\angle ABC$$

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

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

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

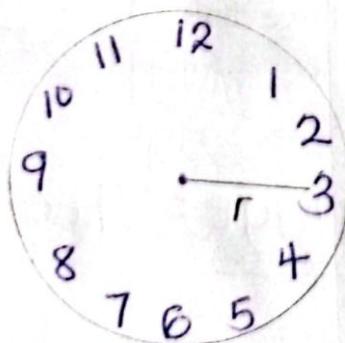
$$\frac{2a}{2} = \frac{112^\circ}{2}$$



$$a = 56^\circ$$

$$\therefore \angle ABC = 56^\circ$$

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



$$2\pi r = C$$

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

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

$$\frac{144r}{44} = \frac{88 \text{ cm} \times 7}{44}$$

$$r = (2 \times 7) \text{ cm}$$

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

\therefore The length of the minute hand is

$$14 \text{ cm}$$

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?

LCM of 25 and 20

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

$$\begin{aligned}
 & 2 \times 2 \times 5 \times 5 \\
 & (2 \times 5) \times (2 \times 5) \\
 & 10 \times 10 \\
 & \underline{100}
 \end{aligned}$$



First term	2nd term
$\frac{20}{25} \times \frac{4}{1}$	$\frac{18}{20} \times \frac{5}{1}$
20×4	18×5
$\underline{80}$	$\underline{90}$

\therefore In the second term test

Turn Over

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)

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

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

$$\underline{\underline{\frac{3}{16}}}$$

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

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

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

(b) Work out:

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

(02 marks)

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

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

$$\underline{\underline{0.36}}$$

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

$$\frac{36}{100}$$

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

Method 2 (04 marks)

$$S = D \div T$$

$$S = \left(\frac{400 \text{ m}}{1000 \text{ m}} \div \frac{48 \text{ s}}{3600 \text{ s}} \right) \text{ km/h}$$

$$S = \left(\frac{1}{1000} \times \frac{30}{48} \right) \text{ km/h}$$

$$S = (30 \times 1) \text{ km/h}$$

$$\underline{\underline{S = 30 \text{ km/h}}}$$

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

$$\text{m/s to km/h}$$

$$\left(\frac{\text{m/s}}{1000} \times 3600 \right) \text{ km/h}$$

$$\left(\frac{25}{3} \times \frac{3600}{1000} \right) \text{ km/h}$$

$$(5 \times 6) \text{ km/h}$$

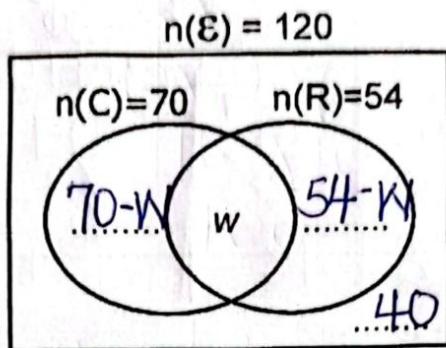
$$\underline{\underline{30 \text{ km/h}}}$$

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

$$S = \left(\frac{25}{3} \right) \text{ m/s}$$

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)

$$W = (70 + 54 + 40) - 120 \quad ; \underline{44 \text{ guests}}$$

$$W = 164 - 120 \quad ; \underline{44 \text{ guests}}$$

$$W = \underline{44}$$

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	

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

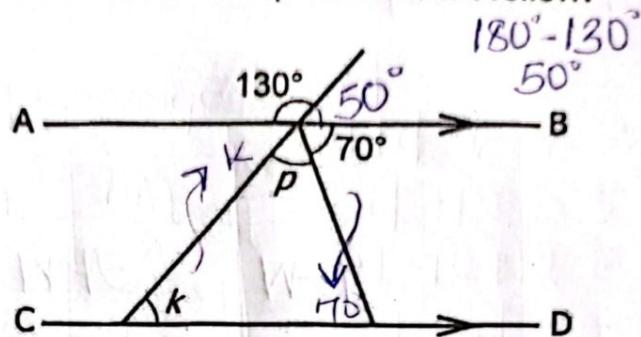
$\frac{126 \text{ pupils}}{18 \text{ pupils}} \Bigg) \text{ groups}$

$\underline{\underline{7 \text{ groups}}}$



Turn Over

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)

$$P = 180^\circ - (70^\circ + 50^\circ)$$

$$P = 180^\circ - 120^\circ$$

$$\underline{P = 60^\circ}$$

- (b) angle k.

(02 marks)

$$K = 180^\circ - (P + 70^\circ)$$

$$K = 180^\circ - (60^\circ + 70^\circ)$$

$$\underline{K = 180^\circ - 130^\circ}$$

$$\underline{K = 50^\circ}$$

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)

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

$$\begin{aligned}\text{Mass in kg} &= \left(\frac{10}{40 \times 250\text{g}} \right) \text{kg} \\ &= \frac{10}{1000\text{g}} \text{kg} \\ &= \underline{(10 \times 1)\text{kg}} \\ &= \underline{10\text{kg}}\end{aligned}$$

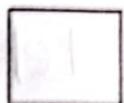
- (b) A family uses a packet of salt every 5 days. Find the number of days the carton will last the family. (02 marks)

1 packet takes 5 days

40 packets take ~~(40 × 5)~~ days

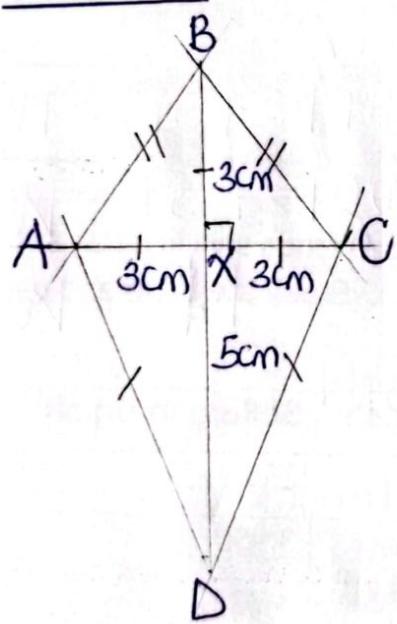
$$(40 \times 5) \text{ days}$$

$$\underline{\underline{200 \text{ days}}}$$

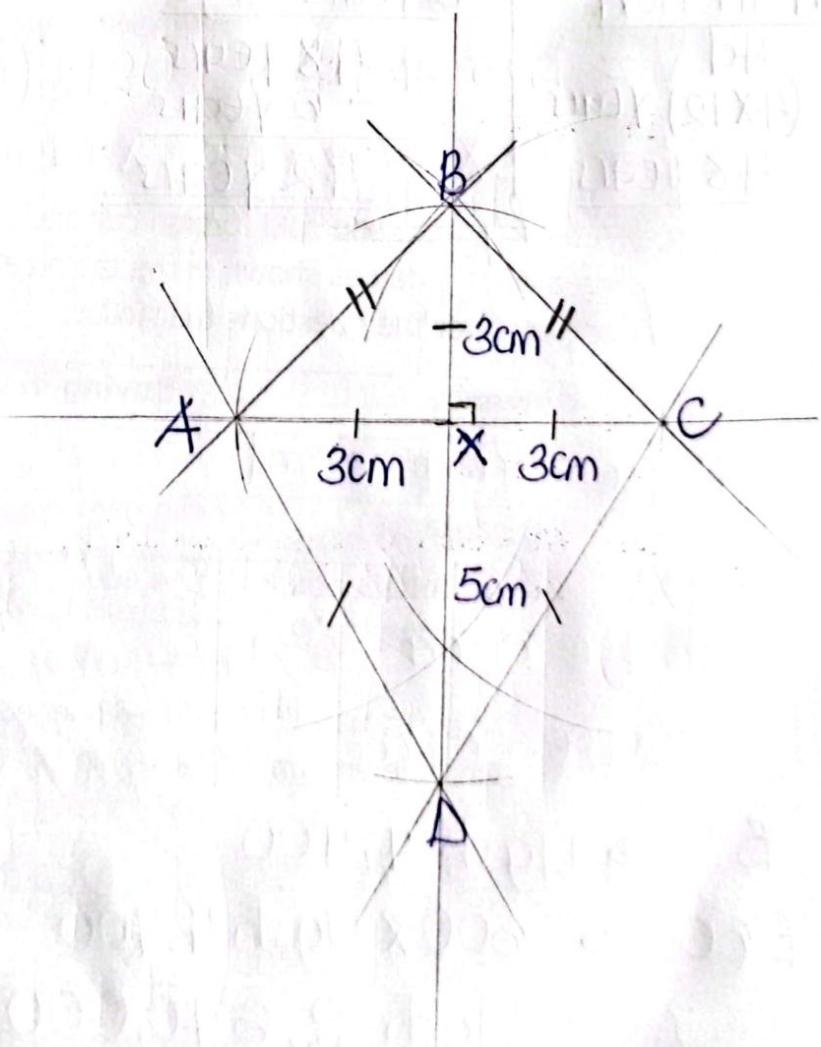


27. Using a ruler and a pair of compasses only, construct a kite ABCD in which diagonal AC = 6 cm. Diagonal BD bisects AC at X such that BX = 3 cm and DX = 5 cm. (05 marks).

Sketch



Accurate diagram



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 d

	Daughter	Man	Sum
Now	d	$4d$	
6 years ago	$d-6$	$4d-6$	48

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

$$5d - 6 - 6 = 48$$

$$d = 12$$

$$5d - 12 = 48$$

$$\therefore 12 \text{ years}$$

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

$$5d = 60$$

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

$$d = 12 \text{ years old}$$

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

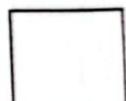
(02 marks)

Man now

$$\begin{array}{l} 4d \\ (4 \times 12) \text{ years} \\ 48 \text{ years} \end{array}$$

6 years ago

$$\begin{array}{l} 48 \text{ years} \\ - 6 \text{ years} \\ \hline 42 \text{ years} \end{array}$$



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 → $600 \times \text{Ugsh } 4,400$

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.

$$\text{US\$1} \rightarrow \text{Ugsh } 3,900$$

(04 marks)

$$\text{US\$200} \rightarrow \text{Ugsh } 3,900 \times 200$$

$$\text{Ugsh } 780,000$$

$\therefore \underline{\underline{30,000 \text{ Kenya}}}$
shillings

$$\text{Ugsh } 26 \rightarrow \text{Ksh } 1$$

$$\text{Ugsh } 780,000 \rightarrow \text{Ksh } \left(\frac{\text{Ugsh } 780,000}{\text{Ugsh } 26} \right)$$

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.

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

(04 marks)

$$\text{Duration} = \left(\frac{6 \times 3}{6+3} \right) \text{days}$$

$$\left(\frac{18^2}{9} \right) \text{days}$$

2 days

$\therefore \underline{\underline{\text{They took 2 days}}}$

- (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.

1 day

$$1 \text{ person} \rightarrow \text{sh } 15,000$$

2 days 2 workers

$$\text{sh } 30,000$$

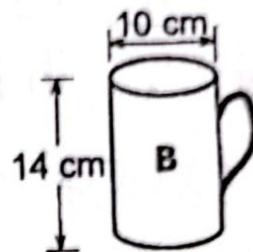
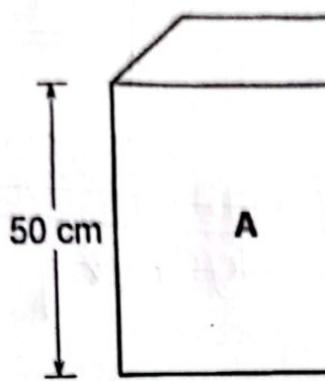
$$2 \text{ workers} \rightarrow 2 \times \text{sh } 15,000$$

$$\underline{\underline{\text{sh } 30,000}}$$

$$\times 2$$

$$\underline{\underline{\text{sh } 60,000}} \quad \boxed{ }$$

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)

$$V = \pi r^2 H$$

$$V = \frac{22}{7} \times \frac{10}{2} \times \frac{10}{2} \times 14$$

$$V = 22 \text{ cm} \times 50 \text{ cm}^2$$

$$\boxed{V = 1100 \text{ cm}^3}$$

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

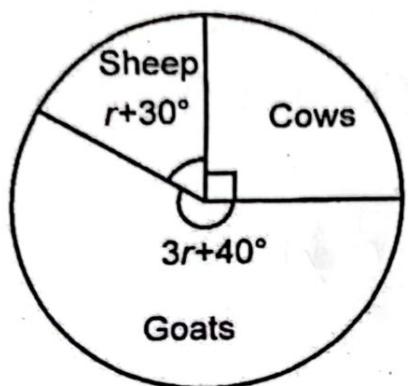
$$\text{Base area} = \frac{\text{Volume of cylinder} \times 40}{\text{Height}}$$

$$\text{Base area} = \frac{1100 \text{ cm} \times \text{cm} \times 14 \times 40}{50 \text{ cm}}$$

$$\text{Base area} = 220 \text{ cm} \times 4 \text{ cm}$$

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

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 .

$$\begin{aligned}
 3r + 40^\circ + r + (30^\circ + 90^\circ) &= 360^\circ \\
 (3r + r) + (40^\circ + 120^\circ) &= 360^\circ \\
 4r + 160^\circ &= 360^\circ \\
 4r + 160^\circ - 160^\circ &= 360^\circ - 160^\circ \\
 4r &= 200^\circ
 \end{aligned}$$

(02 marks)

$$\begin{aligned}
 \frac{4r}{4} &= \frac{200^\circ}{4} \\
 r &= 50^\circ
 \end{aligned}$$

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

Goats	Sheep	
$3r + 40^\circ$	$r + 30^\circ$	$\left(11 \div \frac{110}{360}\right)$ animals
$(3 \times 50^\circ) + 40^\circ$	$50^\circ + 30^\circ$	$\left(11 \times \frac{360}{110}\right)$ animals
$150^\circ + 40^\circ$	80°	
<u>190°</u>		
<u>Difference</u>		
<u>$(190 - 80)^\circ$</u>		<u>36 animals</u> <input type="checkbox"/>
<u>$\frac{110}{360}$</u>		
<u>$\frac{110}{360} \rightarrow 11$ more</u>		

∴ 36 animals are on the farm.