SECTION A: 40 MARKS

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

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

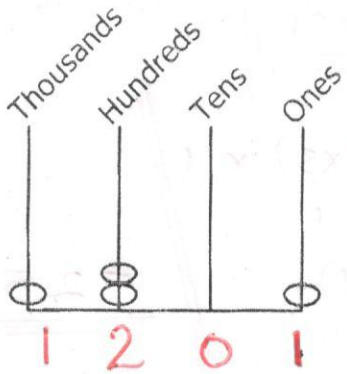
1. Work out: 63 + 54

T	O
6	3
+ 5	4
11	7

OR

60 + 3
+ 50 + 4
110 + 7
= 117

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

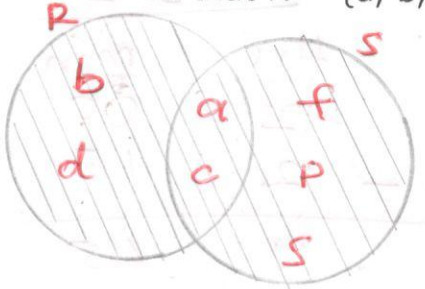


= 1201

OR

1201_{ten}

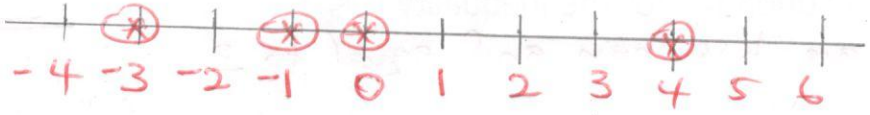
3. Given that R = {a, b, c, d} and S = {a, f, p, c, s}, find n(R∪S).



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.

Day no, + days = — (Finite 7)
3 + 30 = — (Finite 7)
(30+3) ÷ 7
33 ÷ 7 = 4 rem (5)
= 5 (Finite 7)

Training ended on a Friday.

6. Change 750 millilitres into litres.

1000ml = 1 litre
750ml = (750/1000) Litres
= 0·75 litres

MTD 2
1000ml = 1 litre
1ml = 1/1000 litre
750ml = 1/1000 x 750 l
= 75 Litres / 100
= 0·75 litres

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

$4^2 + 3^2 \times 9^0 = (4 \times 4) + (3 \times 3) \times 1$
$= 16 + 9 \times 1$
$= 16 + (9 \times 1)$
$= 16 + 9$
$= 25$

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

Hrs	min
1	20
+12	00
13	20
- 2	15
11	05

= 11:05 am

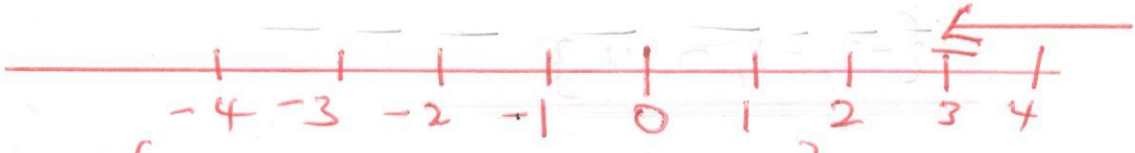
MTD 2

Hrs	min
11	60
+12	00
- 2	15
9	45
+ 1	20
11	05

= 11:05 am

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

P integers are less than and equal to 3



= {3, 2, 1, 0, -1, -2 - - - - - -}

Turn Over

10. Find the next number in the sequence:

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

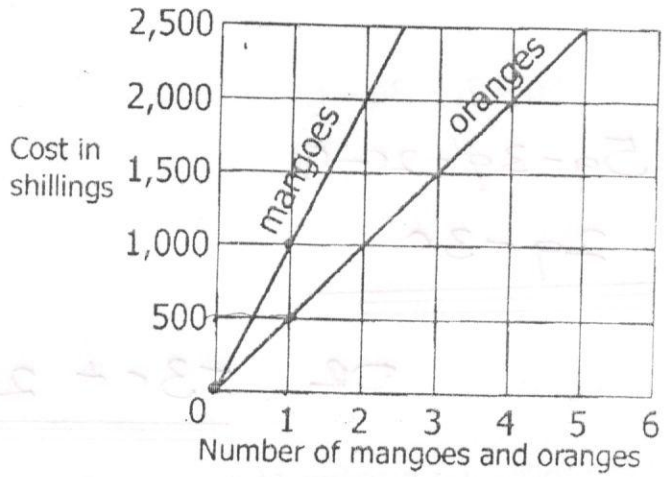
1^3 2^3 3^3 4^3 5^3 (5x5x5)

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

B	N	Rem
3	14	2
3	4	1
	1	

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

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.

1 mango cost shs 1000

2 mangoes cost 2x sh 1000

= sh. 2000

1 orange cost sh 500

3 oranges cost sh 500 x3

= sh 1500

Total cost

shs 2000

+ shs 1500

shs 3500

MTD 2

(2x sh1000) + (3x sh500)

sh2000 + sh1500

= shs 3500

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

Note A number is divisible by 9 if the sum of its digits form a multiple and can be divided by 3 or 9.

Multiples of 9

9, (18) 27 - - -

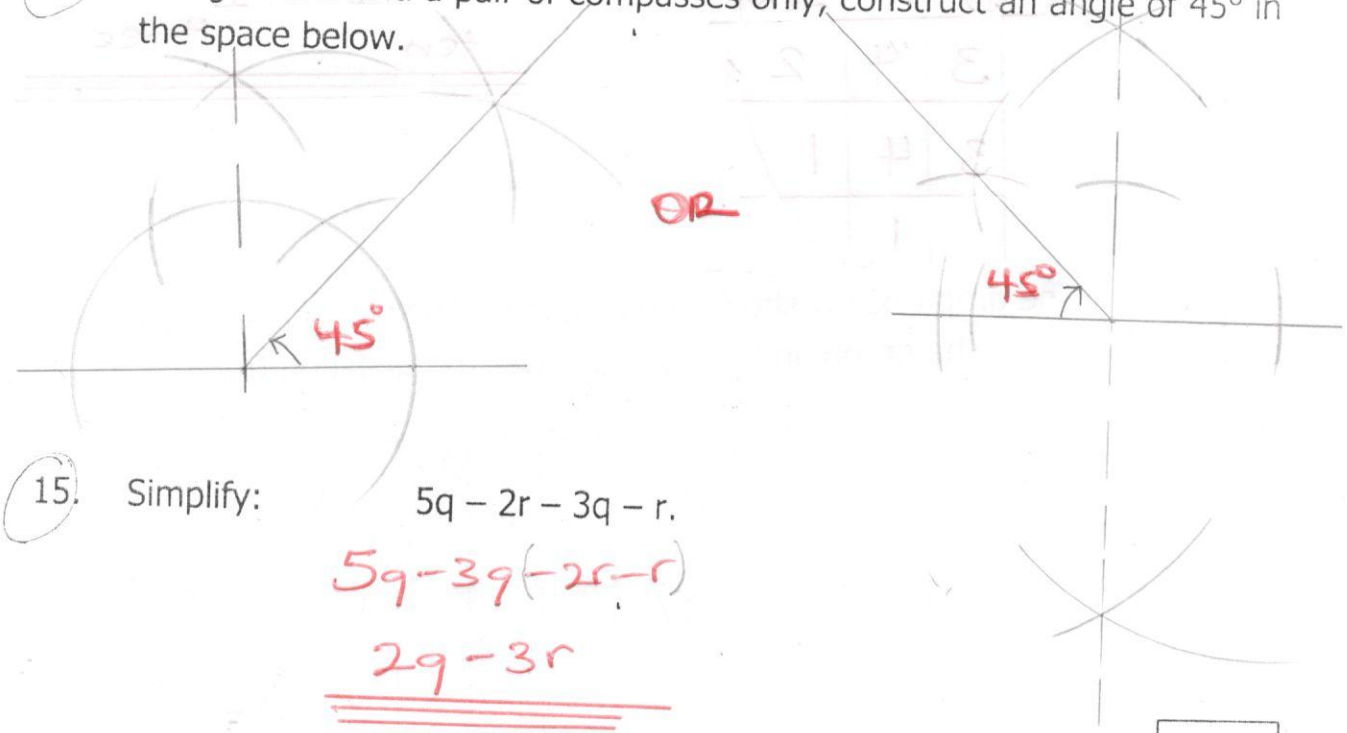
$7+8+t = 18$

$15+t = 18$

$15-15+t = 18-15$

$t = 3$

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



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

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

$2q-3r$

OR $-3r+2q$

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.

Average = $\frac{\text{Total no. of eggs}}{\text{Number of days}}$

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

$= \frac{213}{3}$

$= 71$ eggs per day

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.

S.P = C.P − Loss

= shs. 45000

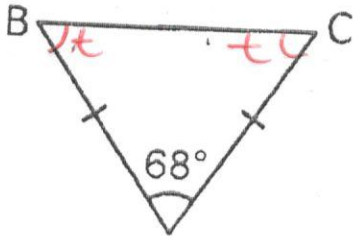
− shs 1500

shs, 43500

= shs. 43,500

Note:
A loss is obtained when the buying price is greater than the selling price

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



Let ∠ABC be t

t + t + 68° = 180°

2t + 68° = 180°

2t + 68° − 68° = 180° − 68°

2t = 112°

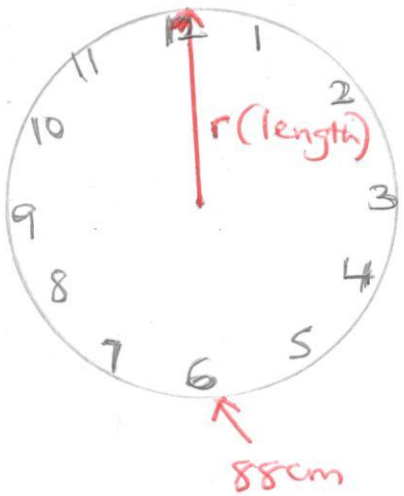
$\frac{2t}{2} = \frac{112^{56}°}{2}$

t = 56°

∠ABC = t

= 56°

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



$2\pi r = c$

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

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

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

$r = \frac{2}{88}cm \times \frac{7}{44_1}$

r = 14cm

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?

First term score

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

$= 80\%$

Second term score

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

$= 90\%$

The Pupil 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)*

BODMAS ✓ ✓

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

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

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

LCm = 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)*

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

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

$= \frac{3}{\cancel{27}} \times \frac{12}{\cancel{10}} \times \frac{\cancel{10}}{\cancel{9}_1}$

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

$= \frac{36}{100}$

$= 0.36$

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

Distance

1000m = 1km

$400m = \left(\frac{\cancel{400}}{\cancel{1000}}\right) km$

$= \frac{2}{5}$ km

Time

3600sec = 1hr

$48sec = \left(\frac{\cancel{48}\,4}{\cancel{3600}\,3}\right) hr$

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

Speed

$= D \div T$

$= \left(\frac{2}{5} \div \frac{4}{300}\right) km/hr$

$= \frac{2}{\cancel{5}_1} \times \frac{\cancel{300}^{60}}{\cancel{4}_1} km/hr$

$= (2 \times 15)\ km/hr$

$= 30\ km/hr$

MTD =

$= \frac{400}{1000} \div \frac{48}{3600}$

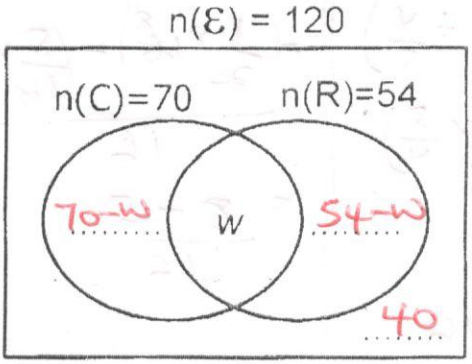
$= \frac{\cancel{400}^{1}}{\cancel{1000}} \times \frac{\cancel{3600}^{3}}{\cancel{48}_{12_1}} km/hr$

$= (10 \times 3)\ km/hr$

$= 30\ km/hr$

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)*

$70+54-w+40=120$

$-w+164=120$

$-w+164-164=120-164$

$-w=-44$

$-w\times-1=-44\times-1$

$w=44$

44 guest 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)*

2	126	90	72
9	63	45	36
	7	5	4

$=(9\times2)$ pupils

$=18$ pupils

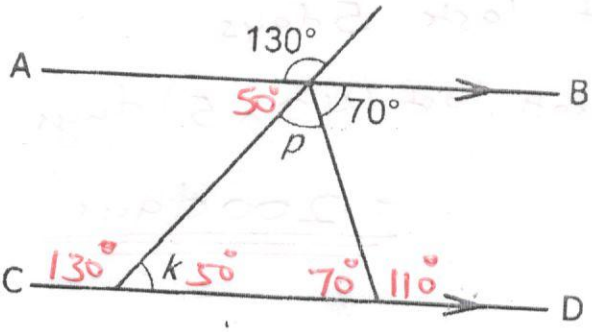
(b) How many groups were formed in Primary Five? *(02 marks)*

$=126+47$

18

$=7$ 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.



$180^\circ - 130^\circ = 50^\circ$

Find the size of;

(a) angle p.

$P + 50^\circ + 70^\circ = 180^\circ$
$P + 120^\circ = 180^\circ$
$P + 120^\circ - 120^\circ = 180^\circ - 120^\circ$
$P = 60^\circ$

MTD 2

$P + 70^\circ = 130^\circ$ (Alternate) (02 marks)
$P + 70^\circ - 70^\circ = 130^\circ - 70^\circ$
$P = 60^\circ$

(b) angle k.

$K = 50^\circ$ (Alternate angles)

MTD 2 (02 marks)

$K + 70^\circ + 60^\circ = 180^\circ$
$K + 130^\circ = 180^\circ$
$K + 130^\circ - 130^\circ = 180^\circ - 130^\circ$
$K = 50^\circ$

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.

MTD 1

1 packet contain 250g
40 packets contain $250g \times 40$
$= 10,000g$

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

MTD 2 (02 marks)

$1000g \Rightarrow 1kg$
$250g = \left(\frac{250}{1000}\right) kg$
$= \frac{1}{4} kg$

40 packets $= \frac{10}{40} \times \frac{1}{4} kg$
$= 10kg$

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

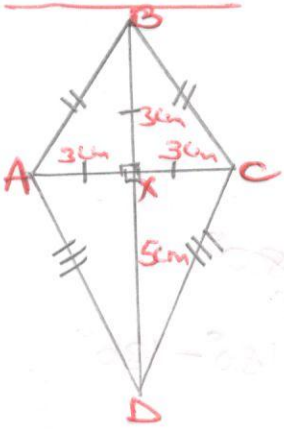
1 Packet lasts 5 days

40 Packets last (40 × 5) days

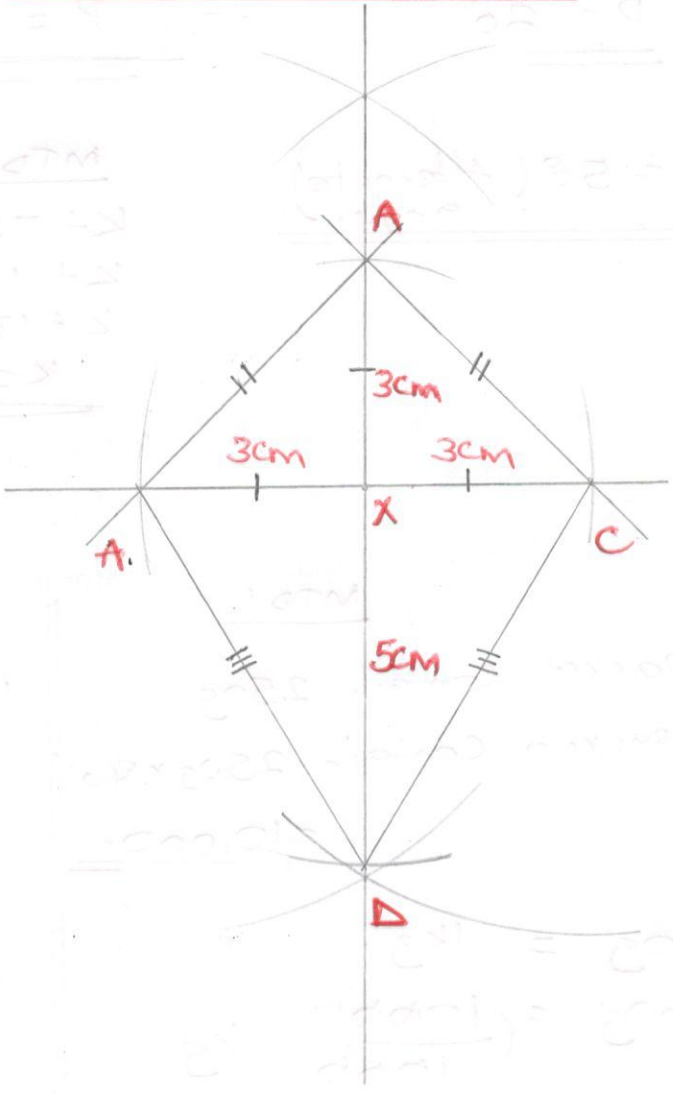
= 200 days

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:



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 K

Time	Now	6yrs ago	Total
Daughter	K	K-6	48
Man	4K	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

Daughter = (K) yrs

= 12 years

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

= (4K-6) yrs

= (4×12-6) yrs

= (48-6) yrs

= 42 yrs

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 (buying)

600£ = Ugsh. 4400 × 600

= Ugshs. 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)

MTD 1

1 dollar = Ugsh. 3900

200 dollars = Ugsh 3900 × 200

= Ugsh 780000

Ugsh 26 = 1 ksh.

Ugsh 780,000 = $\frac{780,000}{26}$

= 30,000 Ksh.

MTD 2

Ksh = $\frac{200 \times 3900}{26}$

= 100 × 300

= 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 1 day,

Worker 1 takes $\frac{1}{6}$

Worker 2 takes $\frac{1}{3}$

Both workers take $\frac{1}{6} + \frac{1}{3}$

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

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

= $\frac{3}{6}$

= $\frac{1}{2}$

Time

= $1 \div \frac{1}{2}$

= $1 \times \frac{2}{1}$

= 2 days

MTD 2

= Product / Sum

= $\frac{6 \times 3}{6+3}$

= $\frac{18}{9}$

= 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 pays 2 × shs 15,000

= shs 30,000

2 days pay shs. 30,000 × 2

= shs. 60,000

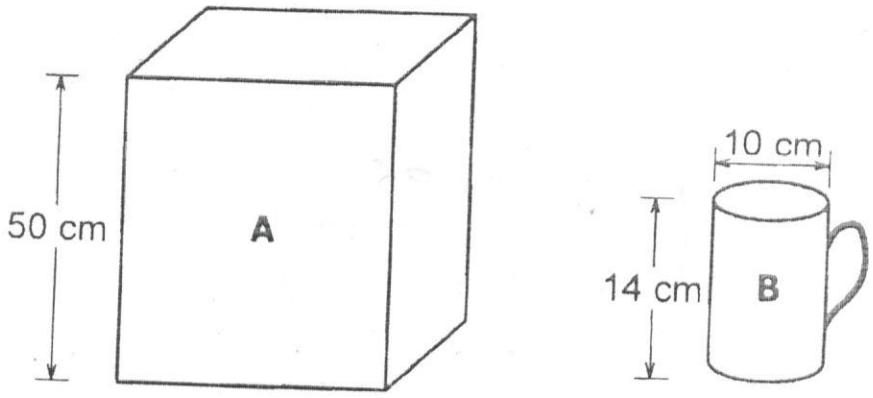
MTD 2

shs. 15000

× 4

shs 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)*

$r = \frac{D}{2}$

$= \frac{10cm}{2}$

$= 5cm$

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

$= \frac{22}{7} \times 5cm \times 5cm \times 14cm$

$= 22 \times 50 cm^3$

$= 1100 cm^3$

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

Volume of A = volume of B

base area $\times h = \pi r^2 h \times 40$

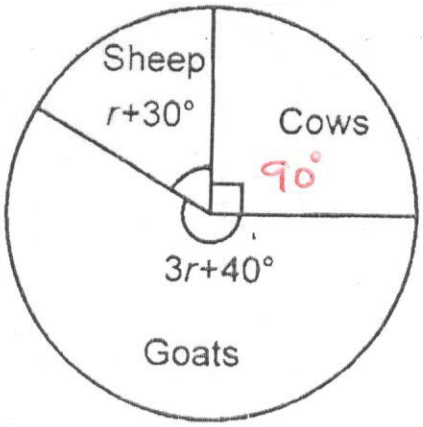
B·A $\times$ 50cm $= 1100 cm^3 \times 40$

$B \cdot A = \frac{1100 cm^3 \times 40}{50cm}$

$= \frac{1100 cm \times cm \times cm \times 40}{50 cm}$

$= 880 cm^2$

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)*

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

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

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

$4r = 200^\circ$

$\frac{4r}{4} = \frac{200^\circ}{4}$

$r = 50^\circ$

(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

$= 3r + 40^\circ$

$= (3 \times 50^\circ) + 40^\circ$

$= 190^\circ$

Sheep

$= r + 30^\circ$

$= 50^\circ + 30^\circ$

$= 80^\circ$

Difference

$190^\circ - 80^\circ$

$= 110^\circ$

MTD 1 (Proportion)

110° rep 11

1° rep $\frac{11}{110^\circ}$

360° rep $\frac{11}{110^\circ} \times 360^\circ$

$= 36$ animals

MTD 2 (Reciprocal)

Total $= 11 \div 110^\circ$

$= 11 \div \frac{110^\circ}{360^\circ}$

$= 11 \times \frac{360^\circ}{110^\circ}$

$= 36$ animals

END