



Dr. Blosa Science

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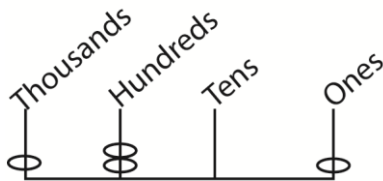


PLE 2023 math marking guide

SECTION A: 40 MARKS

Question 1 to 20 carry two mark each

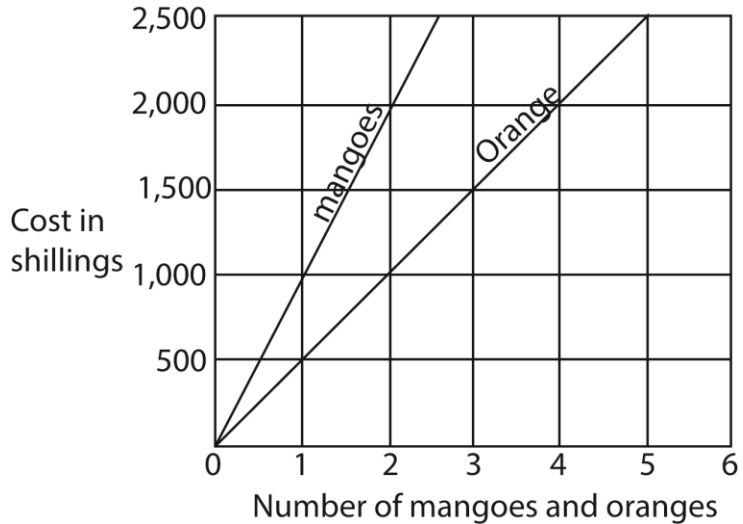
1. Work out:  $63 + 54$
2. Write the base ten number shown on the abacus below.



3. Given that  $R = \{a, b, c, d\}$  and  $S = \{a, f, p, c, s\}$ , find  $n\{R \cup S\}$
4. Arrange the integers  $-3, 4, 0$  and  $-1$  in ascending order.
5. Training for scouts started on a Wednesday and took 30 days. Find the day of the week on which the training ended.
6. Change 750 millilitres into litres
7. Find the value of  $4^2 + 3^2 \times 9^0$ .
8. A meeting that took 2 hours and 15 minutes ended at 1:20 p.m. At what time did the meeting begin?
9. Write the solution set for the inequality  $P \leq 3$ .
10. Find the next number in the sequence:

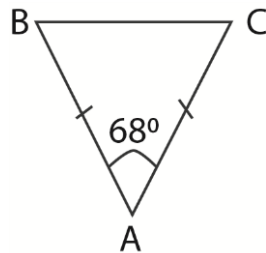
1, 8, 27, 64, .....

11. Change  $14_{\text{ten}}$  to base 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 2 mangoes and 3 oranges.

13. Given that  $78t$  is a three-digit number which is divisible by 9, find digit represented by  $t$ .
14. Using a ruler and a pair of compasses only, construct an angle of  $45^\circ$  in the space below.
15. Simplify:  $5q - 2r - 3q - r$ .
16. A farmer sold the following number of eggs in a period of 3 days; 62, 73, and 78.  
Calculate the average number of eggs the farmer sold in that period.
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.
18. In the diagram below, calculate the size of angle ABC.



19. In one hour, the minute hand of a clock covers 88cm. calculate the length of the minute hand. (use  $\pi = \frac{22}{7}$ )
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 term did the pupil perform better?

## SECTION B: 60 MARKS

Answer all the questions in this section

Marks for each question are indicated in brackets

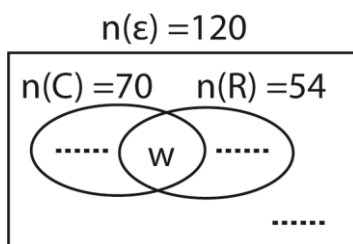
21. (a) simplify:  $\frac{1}{2} - \frac{1}{4} \div \frac{4}{5}$  (03marks)

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

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

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)



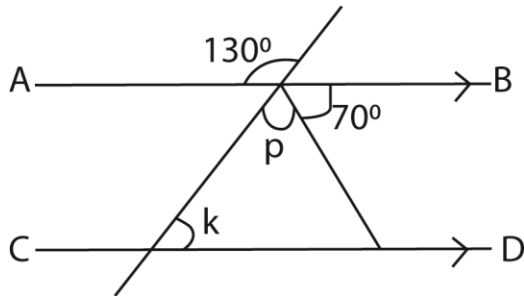
(b) Calculate the number of guests who attended both the church service and reception (02 marks)

24. In 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. (03marks)

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

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 (02marks)
- (b) Angle k

26. A carton of salt contains 40 packets. Each packet has a mass of 250 grams

- (a) Work out the mass in kilograms, of all the packets of salt in the carton. (02marks)
- (b) A family uses a packet of salt every 5 days. Find the number of days the carton will last the family. (02marks)

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

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

Find

- (a) the age of the daughter now. (03marks)
- (b) the age of the man six years ago. (02marks)

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

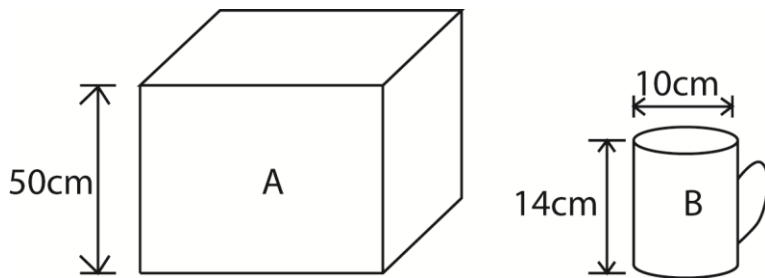
Currency	Buying in Ug. Sh	Selling in Ug.sh
1 Kenya shillings (Ksh)	24	26
1 US dollar (\$)	3,900	3,950
1Great Britain pound (£ )	4,400	4,700

- (a) A tourist had £600 and exchanged for Uganda shillings. Find the amount of money in Uganda shillings the tourist got. (02 marks)
- (b) Moses has US dollars 200 to exchange for Kenya shillings. Find the amount of money in Kenya shillings he got from the bank. (04marks)

30. A farmer employed two workers to dig a piece of land. The first worker could dig 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.

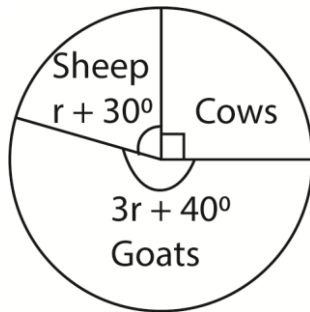
- (a) Find the number of days they took to dig the piece of land. (04marks)
- (b) The farmer paid each worker sh 15,000 per day. Calculate the amount of money the farmer spent to dig the piece of land. (02marks)

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  $\pi = \frac{22}{7}$ ) (02marks)
- (b) Calculate the base area of container A. (03marks)

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



- (a) Find value of r. (02marks)
- (b) Given that there are 11 more goats than sheep on the farm, calculate the total number of animals on the farm. (04marks)

### Suggested answers

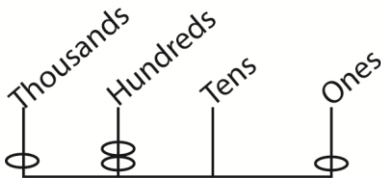
1. Work out:  $63 + 54$

#### Solution

$$\begin{array}{r} 64 \\ +53 \\ \hline 117 \\ \hline \end{array}$$

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

#### Solution



**1201**

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

#### Solution

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

$$n\{R \cup S\} = 7$$

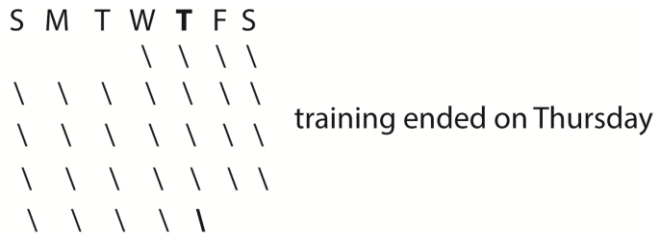
4. Arrange the integers  $-3$ ,  $4$ ,  $0$  and  $-1$  in ascending order.

#### Solution

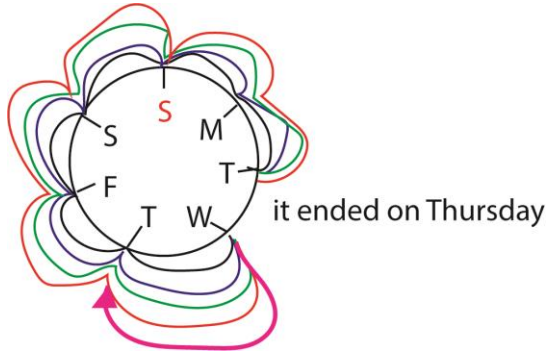
$$-3, -1, 0, 4$$

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

#### Solution



Or



6. Change 750millilitres into litres

**Solution**

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

$$750 \text{ ml} = \frac{750}{1000} = 0.75\text{Litre}$$

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

**Solution**

$$4^2 + 3^2 \times 9^0 = 4^2 + 3^2 \times 1$$

$$= 16 + 9 \times 1$$

$$= 16 + 9$$

$$= 25$$

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

**Solution**

1:20 p.m = 13:20

Beginning time

$$\begin{array}{r} 13:20 \\ - 2:15 \\ \hline 11:05 \\ \hline \hline \end{array}$$

The meeting begun on 11.05 a.m

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

**Solution**

The solution set is  $\{..... \bar{1}, 0, 1, 2, 3\}$

10. Find the next number in the sequence:

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

**Solution**

The sequence is that of cube of numbers, hence the next number =  $5^3 = 125$

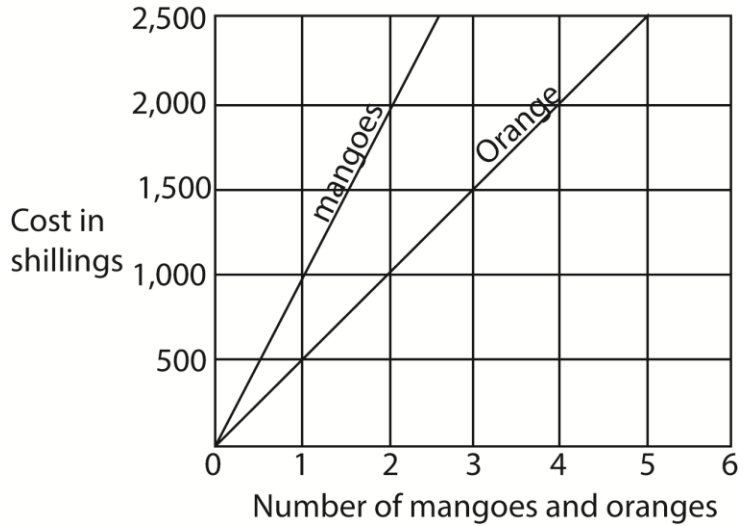
11. Change  $14_{\text{ten}}$  to base three.

	14	R
3	4	2
3	1	1

Hence  $14_{\text{ten}} = 112_{\text{three}}$

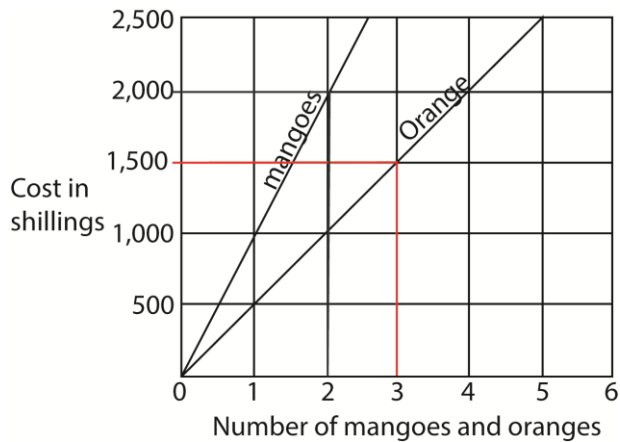
12. The graph below shows the cost in shillings of mangoes and oranges. Study the graph and use it to answer the question that follows.





Find the total cost 2 mangoes and 3 oranges.

**Solution**



From the graph

The cost of 2 mangoes = 2000

The cost of 3 oranges = 1500

Total cost = 2000 + 1500

= 3500

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

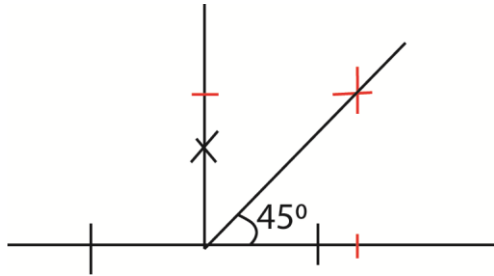
**Solution**

The number between 780 and 789 that divisible by 9 is 783

$$\therefore t = 3$$

14. Using a ruler and a pair of compasses only, construct an angle of  $45^\circ$  in the space below.

**Solution**



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

**Solution**

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

$$= 2q - 3r$$

16. A farmer sold the following number of eggs in a period of 3 days; 62, 73, and 78. Calculate the average number of eggs the farmer sold in that period.

**Solution**

Sum of numbers

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

Average of numbers =  $213 \div 3$

$$\begin{array}{r} 71 \\ 3 \overline{) 213} \\ \underline{-21} \phantom{0} \\ 003 \\ \underline{-3} \\ 0 \end{array}$$

Hence average number of eggs = 71

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.

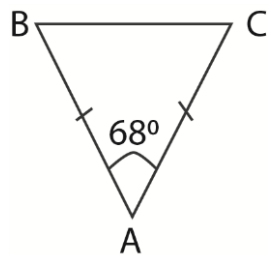
Solution

$$\text{Selling price} = 45,000 - 1,500$$

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

Hence the selling price = 43,500

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



Solution

$$\angle ABC = \angle BCA = 2\angle ABC$$

$$\angle ABC + \angle BCA + 68^\circ = 180^\circ \text{ (angle sum of a triangle)}$$

$$2\angle ABC = 180 - 68$$

$$= 112$$

$$\angle ABC = \frac{112}{2}$$

$$= 56^\circ$$

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

**Solution**

In 1 hour the minute hand (of length  $r$ ) moves through a  $\frac{1}{12}$  of the circumference of a circle.

Circumference of a circle =  $2\pi r$

$$\Rightarrow \frac{2\pi r}{12} = 88$$

$$2\pi r = 88 \times 12$$

$$2 \times \frac{22}{7} r = 88 \times 12$$

$$r = 88 \times 12 \times \frac{7}{22} \times \frac{1}{2}$$

$$= 168\text{cm}$$

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 term did the pupil perform better?

**Solution**

Changing the fraction in percentage

$$\frac{20}{25} = \frac{20}{25} \times 100 = 80\%$$

$$\frac{18}{20} = \frac{18}{20} \times 100 = 90\%$$

Hence he did better in second term

## SECTION B: 60 MARKS

Answer all the questions in this section

Marks for each question are indicated in brackets

21. (a) simplify:  $\frac{1}{2} - \frac{1}{4} \div \frac{4}{5}$  (03marks)

### Solution

From: BODMAS

Division first

$$\begin{aligned}\frac{1}{2} - \frac{1}{4} \div \frac{4}{5} &= \frac{1}{2} - \left(\frac{1}{4} \div \frac{4}{5}\right) \\ &= \frac{1}{2} - \left(\frac{1}{4} \times \frac{5}{4}\right) \\ &= \frac{1}{2} - \frac{5}{16} \\ &= \frac{8-5}{16} \\ &= \frac{3}{16}\end{aligned}$$

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

### Solution

$$\begin{aligned}\frac{0.27 \times 1.2}{0.9} &= (0.27 \times 1.2) \div 0.9 \\ &= \left(\frac{27}{100} \times \frac{12}{10}\right) \div \frac{9}{10} \\ &= \frac{324}{1000} \div \frac{9}{10} \\ &= \frac{324}{1000} \times \frac{10}{9} \\ &= \frac{324}{900} = \frac{36}{100} = 0.36\end{aligned}$$

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

**Solution**

1 hour = 3600 seconds

In 48s he moves 400m

In 3600 second he moves  $\frac{3600 \times 400}{48} = 30,000\text{m}$

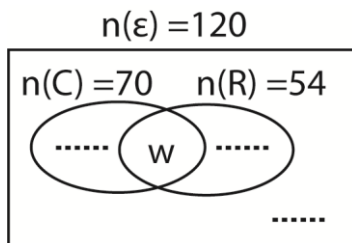
But 1000m = 1km

$30,000\text{m} = \frac{30,000}{1000} = 30\text{km}$

Hence his speed is 30km/hr.

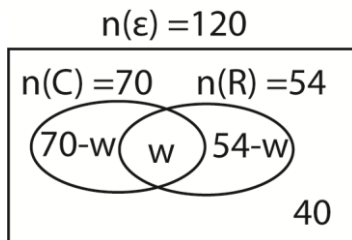
23. A total of 120 guests were invited for a marriage ceremony. 70 guests attended the Church service (C), 54 guests attended the reception (R) and w guests attended both the church service and the reception. 40 guests did not turn up for the marriage ceremony.

- (a) Use the given information to complete the Venn diagram below. (03 marks)



**Solution**

Information on a Venn diagram



- (b) Calculate the number of guests who attended both the church service and reception (02 marks)

**Solution**

The number of guests that attended both church service and reception =  $w$

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

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

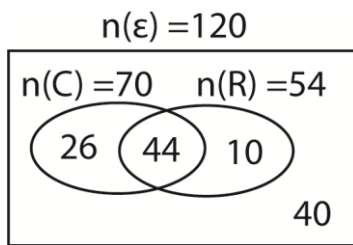
$$164 - w = 120$$

$$w = 164 - 120$$

$$= 44$$

The number of guests that attended both church service and reception = 44

Hence the complete Venn diagram



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. (03marks)

**Solution**

Finding the intersection of the prime factors of the numbers

	five	six	seven
	126	90	72
2	63	45	36
3	21	15	12

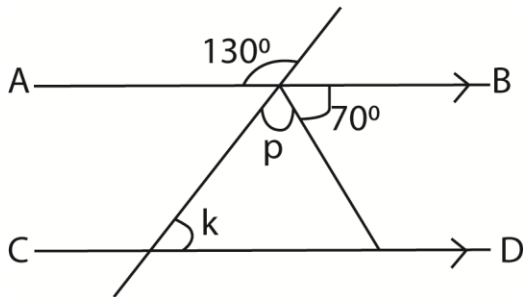
The largest number of pupil in each group =  $2 \times 3 = 6$

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

**Solution**

Number of groups in primary five =  $126 \div 6 = 21$

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 (02marks)

**Solution**

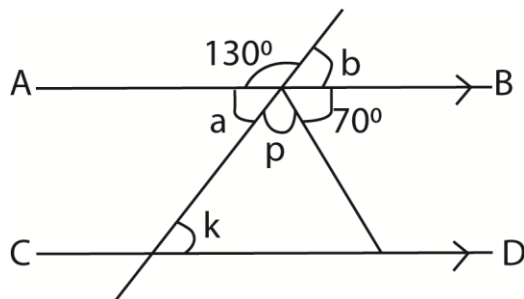
$$p + 70 = 130 \text{ (corresponding angles)}$$

$$p = 130 - 70$$

$$= 60^{\circ}$$

(b) Angle k

**Solution**





$$p + 70 + b = 180 \text{ (angles on straight line)}$$

$$b + 130 = 180$$

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

$$k = b = 50^\circ \text{ (alternate angles)}$$

or

$$k + p + 70 = 180$$

$$k + 130 = 180$$

$$k = 180 - 130$$

$$= 50^\circ$$

26. A carton of salt contains 40 packets. Each packet has a mass of 250 grams

(a) Work out the mass in kilograms, of all the packets of salt in the carton. (02marks)

**Solution**

$$\text{Total mass of salt} = 250 \times 40 = 10,000\text{g}$$

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

$$\Rightarrow 10,000\text{g} = \frac{10000}{1000} = 10\text{kg}$$

$$\text{Hence the mass of salt} = 10\text{kg}$$

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

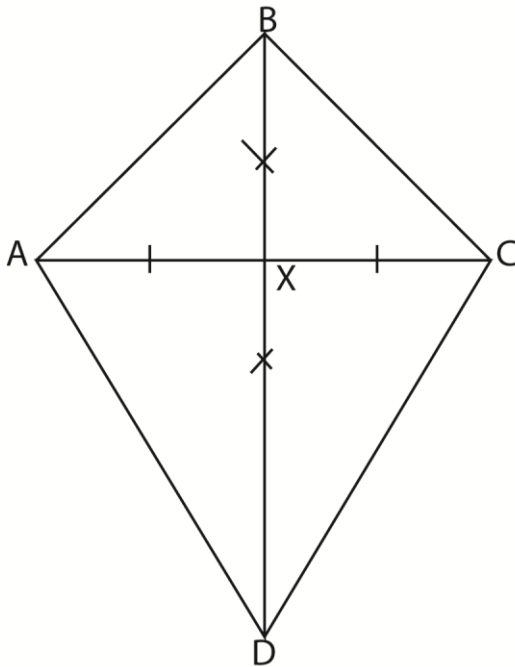
**Solution**

$$1 \text{ packet} = 5\text{days}$$

$$40 \text{ packets} = 5 \times 40 = 200\text{days}$$

Hence the salt will last for 200 days.

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



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

Find

- (a) the age of the daughter now. (03marks)

Solution

Let the age of daughter be  $x$

The age of the man is  $4x$

$$(x - 6) + (4x - 6) = 48$$

$$5x - 12 = 48$$

$$5x = 60$$

$$x = \frac{60}{5} = 12$$

Hence the age of the daughter = 12 years

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

Solution

The age of the man 6 years ago =  $4x - 6$

$$= 4 \times 12 - 6$$

$$= 48 - 6$$

$$= 42 \text{ years}$$

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 shillings (Ksh)	24	26
1 US dollar (\$)	3,900	3,950
1Great Britain pound (£ )	4,400	4,700

(a) A tourist had £600 and exchanged for Uganda shillings. Find the amount of money in Uganda shillings the tourist got. (02 marks)

**Solution**

Note that a tourist sells the pounds at the bank's buying rate

$$£1 = \text{Ug. Sh } 4,400$$

$$\$600 = 4,400 \times 600$$

$$\begin{array}{r} 4400 \\ \times 600 \\ \hline 0000 \\ 0000 \\ + 26400 \\ \hline \underline{\underline{2640000}} \end{array}$$

Hence the tourist gets Ug. sh 2,640,000

- (b) Moses has US dollars 200 to exchange for Kenya shillings. Find the amount of money in Kenya shillings he got from the bank. (04marks)

Solution

Note that a tourist sells the dollars at the bank's buying rate

$$\text{\$1} = \text{Ug. Sh } 3,900$$

$$\text{\$200} = 3,900 \times 200$$

$$= \text{Ug. Sh } 780,000$$

Note that a tourist buy the Kenya shilling at the bank's selling rate

Ug sh 26 buy 1Ksh

$$\text{Ug. Sh } 780,000 \text{ buy } \frac{780,000}{26} = \text{Ksh } 30,000$$

Hence Moses gets K sh 30, 000

30. A farmer employed two workers to dig a piece of land. The first work could dig 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. (04marks)

Solution

Let the total work be  $W$

$$\text{Rate of work 1} = \frac{W}{6}$$

$$\text{Rate of work 2} = \frac{W}{3}$$

$$\text{Combined rate of the two workers together} = \frac{W}{6} + \frac{W}{3} = \frac{3W}{2} = \frac{W}{2}$$

Number of days taken by the two workers =  $W \div$  combined rate

$$= W \div \frac{W}{2} = W \times \frac{2}{W} = 2 \text{ days}$$

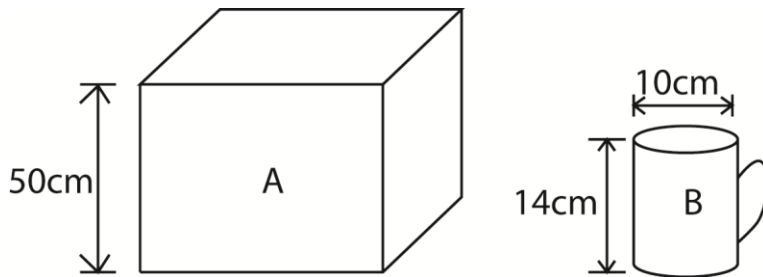
Hence the two workers take 2 days to dig the piece of land

- (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. (02marks)

**Solution**

$$\text{Money spent} = 2 \times 15000 \times 2 = 60,000/=$$

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  $\pi = \frac{22}{7}$ ) (02marks)

**Solution**

$$\text{Volume of cup B} = \pi r^2 h$$

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

$$= 1,100\text{cm}^3$$

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

**Solution**

$$\text{Volume of A} = 1,100 \times 40$$

$$= 44,000 \text{ cm}^3$$

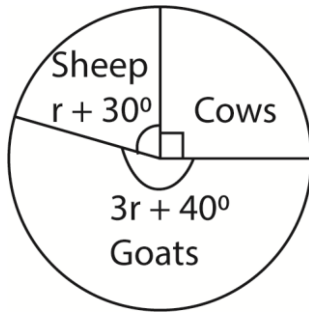
$$\text{Volume} = \text{Area of the base} \times \text{height}$$

$$\text{Area of the base} \times 50 = 44,000$$

$$\text{Area of the base} = \frac{44,000}{50} = 880 \text{ cm}^2$$

$$\text{Hence area of the base} = 880 \text{ cm}^2$$

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



- (a) Find value of  $r$ . (02marks)

**Solution**

$$r + 30 + 3r + 40 + 90 = 360 \text{ (angle sum of a circle)}$$

$$4r + 160 = 360$$

$$4r = 200$$

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

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

**Solution**

$$\text{Number of degrees for sheep} = 50 + 30 = 80^\circ$$

$$\text{Number of degrees for goats} = 3 \times 50 + 40 = 190^\circ$$

Let the total number of animals be  $x$

$$\text{Goats} = \text{sheep} + 11$$

$$\frac{190}{360}x = \frac{80}{360}x + 11$$

$$190x = 80x + 11x \cdot 360$$

$$110x = 3960$$

$$x = 36$$

The total number of animals = 36

Please obtain free notes, exams and marking guides of history, economics, geography ... from [digitalteachers.co.ug](https://digitalteachers.co.ug) website.

Thanks

Dr. Bbosa Science.