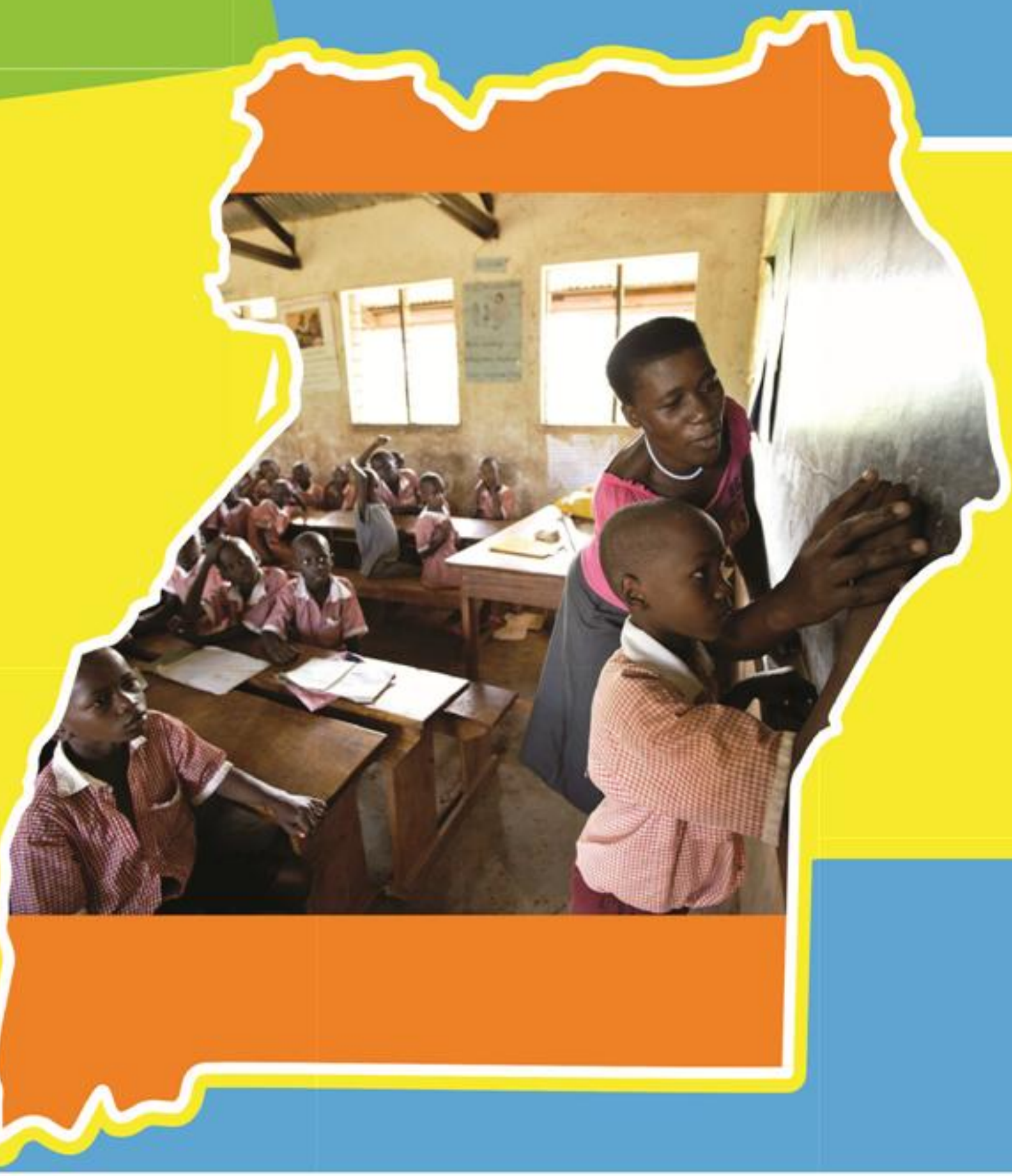
SURE KEY EXAMS

SUREKEY EXAMINATIONS BOARD



SECTION A: 40 MARKS

1. Add: 278 to 2022.

$$\begin{array}{r} 2{,}022 \\ +\ 278 \\ \hline \mathbf{2{,}300} \end{array}$$

2. Write MDLXXXV in Hindu Arabic numerals.

$$\begin{array}{r} MDLXXXV \\ 1000 + 500 + 80 + 5 \\ 1000 \\ 500 \\ 80 \\ +\ \ 5 \\ \hline \mathbf{1{,}585} \end{array}$$

$$\begin{array}{rcr} MDLXXXV & & \\ M & = & 1000 \\ D & = & 500 \\ LXXX & = & 80 \\ V & = & +\ \ 5 \\ \hline & & \mathbf{1585} \end{array}$$

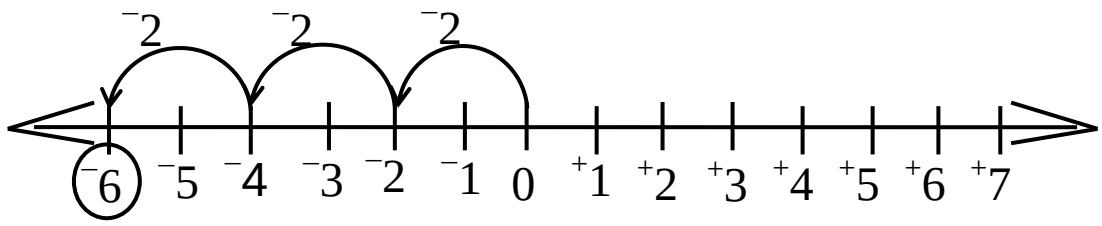
3. Simplify: $1 - \frac{5}{9}$

$$1 - \frac{5}{9}$$

$$\frac{9}{9} - \frac{5}{9} = \frac{9 - 5}{9}$$

$$= \frac{4}{9}$$

4. Write the multiplication statement represented on the numberline below.



$$3 \times {}^{-}2 = {}^{-}6$$

5. In the number 14205, what is the difference between the values of digits 4 and 2?

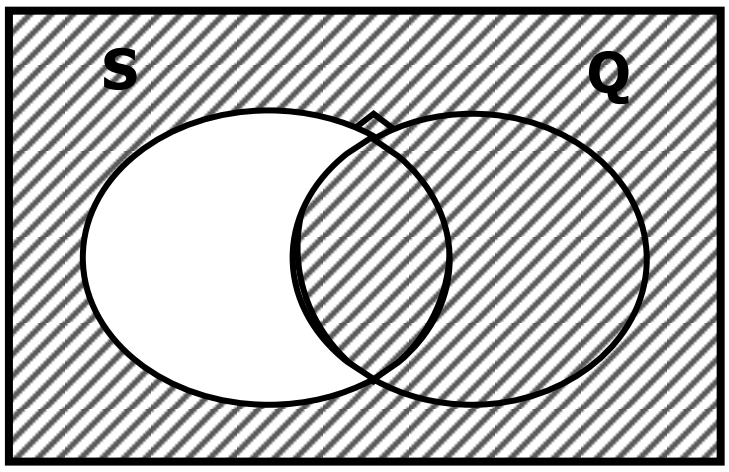
TTh	Th	H	T	O
1	4	2	0	5

$$(4 \times 1{,}000) - (2 \times 100)$$

$$4{,}000 - 200$$

$$\begin{array}{r} 4000 \\ -200 \\ \hline \mathbf{3{,}800} \end{array}$$

6. Describe the shaded region in the Venn diagram below



$(S - Q)'$

The compliment of Set S only

7. What is the square root of the number obtained when 196 is multiplied by 4?

The product of 196 and 4.

$$\begin{array}{r} 196 \\ \times \quad 4 \\ \hline 784 \end{array}$$

The square root of 784

2	2	784
2	2	392
	2	196
2	2	98
	7	49
7	7	7
		1

$\sqrt{784} = 2 \times 2 \times 7$

$= 4 \times 7$

$= 28$

8. What is the mean of 7kg, 5.6kg and 4.2kg?

$$\textbf{Mean} = \frac{\textbf{Sum of data}}{\textbf{No. of data}}$$

$$= \frac{7kg + 5.6kg + 4.2kg}{3}$$

$$= \frac{16.8kg}{3}$$

$$= 5.6kg.$$

Sum
7.0kg
5.6 kg
+4.2 kg
16.8 kg

OR: Sum of data = mean x No. of data

Let the mean be **m**

$7kg + 5.6kg + 4.2kg = m \times 3$

$16.8kg = 3m$

$\frac{16.8kg}{3} = \frac{3m}{3}$

$5.6kg. = m$

$\boldsymbol{m = 5.6kg}$

9. Safi packed 15 cartons each containing 20 bottles of juice. The amount of juice in each bottle was 500ml. what was the total amount of juice, in litres, packed by Safi?

No. of cartons packed.

= 15.

Total number of bottles in the 15 cartons.

15 x 20 = ***300 bottles.***

Amount of juice in ml in 300 bottles.

(300 x 500)ml.

= ***150,000ml.***

Total amount of juice in litres.

150,000 ml ⟶ *litres*

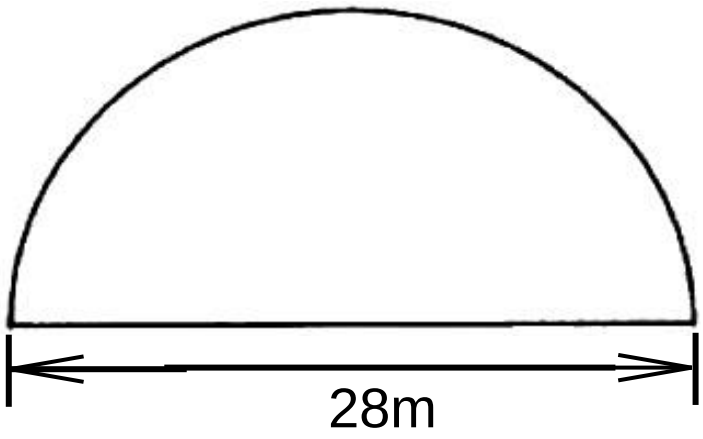
1 ml ⟶ $\frac{1}{1000}$ *litres*

150,000ml ⟶ $\frac{1}{1000}$ x *150000l*

= 150l

Therefore Safi packed 150 litres of juice.

10. A plot of land is in a shape of a semi-circle of diameter 28 metres as shown below.



The plot was fenced with erecting posts 4 metres apart. How many posts were used? (Use $\pi = \frac{22}{7}$)

Total distance of the land.

$Distance = \frac{1}{2}\ \pi\ D + D$

$= \frac{1}{2_1} \times \frac{22^{11}}{7_1} \times \cancel{28}^{4} m + 28m$

$= (11 \times 4m) + 28m$

$= 44m + 28m$

$= \mathbf{72m}$

Total number of posts used;

$= (\frac{distance}{intervals})$ *posts.*

$= (\frac{72m}{4m})$ *posts.*

$= \mathbf{18\ posts.}$

11. Express 20m/s in km/hr.

20m to Km

$1km = 1000m$

$1m = \frac{1}{100}\,km$

$20m = (\frac{1}{100\cancel{0}} \times 2\cancel{0})km$

$= \frac{2}{100}\,km$

Seconds to hr

$1hr = 3600s$

$1\,s = \frac{1}{3600}\,hr$

Km ÷ hr

$(\frac{2}{100} \div \frac{1}{3600})km/hr$

$\frac{2}{1\cancel{00}} \times \frac{36\cancel{00}}{1}\,km/hr$

$= \mathbf{72km/hr}$

OR

20m to Km/hr

$1km = 1000m$

$1hr = 3600s$

$\left(\frac{36\cancel{00}}{1\cancel{000}} \text{ x } 2\cancel{0}\right)km/$

$36 \text{ x } 2\ km/hr$

$= \mathbf{72km/hr}$

12. Given that, a = b = 3 and c = 2. Find the value of 2b(a+c) + ac.

$a=3, b = 3, c = 2$

$2a(a+c)+ac$

$2\times a(a+c)+ (a\times c)$

$2\times 3\ (3\times 2) + 3\times 2$

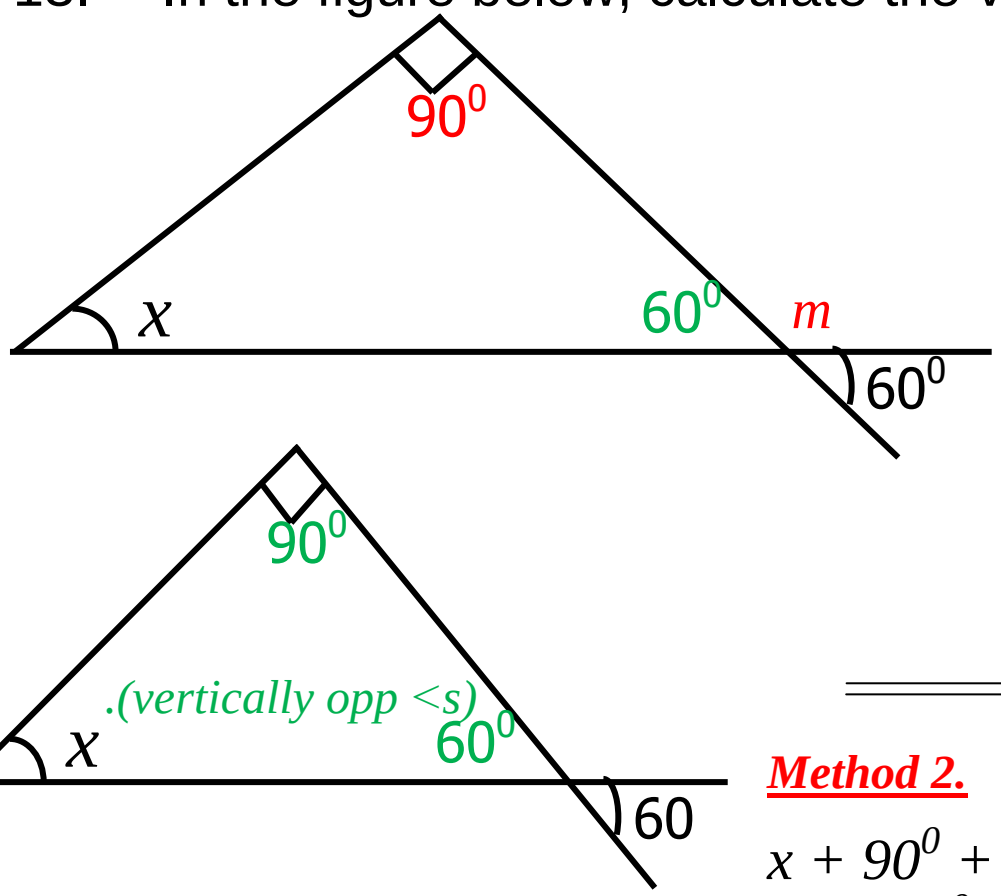
$6(5) + 6$

$6\times 5 + 6$

$30 + 6$

$= \mathbf{36}$

13. In the figure below, calculate the value of x



Method 1.

$x + 90^0 = m$

Value of m.

$m + 60^0 = 180^0$.*(<s on a straight line)*

$m + 60^0 - 60^0 = 180^0 - 60^0$.

$\mathbf{m = 120^0}$

Value of x.

$x + 90^0 = 120^0$.*(two int< = 1 opp ext <)*

$x + 90^0 - 90^0 = 120^0 - 90^0$

$x = \mathbf{30^0}$

Method 2.

$x + 90^0 + 60^0 = 180^0$.*(angle sum of a triangle)*

$x + 150^0 = 180^0$

$x + 150^0 - 150^0 = 180^0 - 150^0$.

$\mathbf{x = 30^0}$.

14. 2 tailors can make 8 shirts in 4 days. How many more days are needed by the two tailors to make 128 shirts?

8 shirts can be made in 4 days.

1 shirt can be made in $\frac{4}{8}$ *days.*

128 shirts can be made in

$\left(\frac{4}{8} \times 128\right)$ *days.*

= *64 days*.

More days

64 – 4

= 60 more days.

15. Find the next number in the sequence below;

9, 18, 27, 36, 45, ...

9, 18, 27, 36, 45, ***54***

+9 +9 +9 +9 +9

45 + 9
= 54

16. A trader borrowed sh.150,000 from a micro finance group that offers an interest rate of 5% per month for 4 months. How much did he pay back at the end of the period?

Amount = P + 1

I = P x T x R

$= \text{Sh.}150{,}000 \text{ x } 4 \text{ x } \frac{5}{100}$

= Sh. 150,0 x 20

I = Sh. 30,000

Amount.

Sh. 150, 000
+Sh. 30, 000
Sh. 180, 000

17. Today is Monday, what day of the week will it be after 11 days

S M T W T F S
0 1 2 3 4 5 6

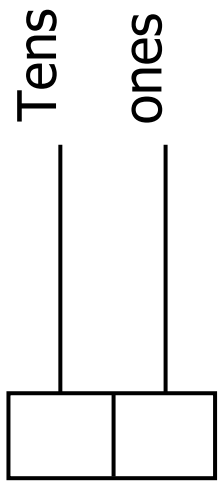
1 + 11 = __ (finite 7)

12 ÷ 7 = 1rem.5(finite 7)
= 5 (finite 7)

The day will be Friday.

18. Show 120_{three} on the abacus below.

Note: Since the abacus is not representing bases, we have to first convert the given base to base ten and then represent the answer on the abacus.



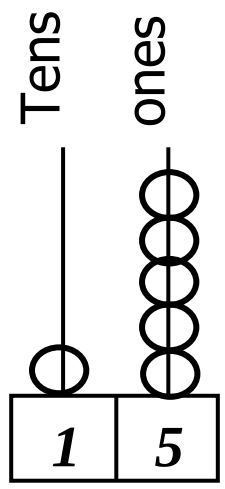
120_{three} to base ten.

$(1x3^2) + (2x3^1)$

$1x3x3+2x3$

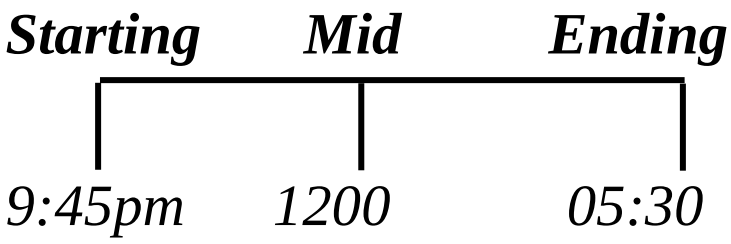
$9 + 6$

$= 15_{ten}$



19. A baby woke up at 5:30a.m.after sleeping for 7 hours and 45 minutes. At what time did the baby sleep?

Using the duration scale.



Remaining time to midnight		***Starting time***	
Hrs	***min***	***Hrs***	***min***
7:45		*12*	*00*
-5:30		*- 2*	*15*
2:15		***9***	***45***

The baby slept at 9:45pm

Using the finite system.

5:00a.m. – 7 (difference in minutes)

5 – 7 = ___(finite 12)

(5+12) – 7 = ___ (finite 12)

17 – 7 = 10 (finite 12)

= 10:00p.m.

Since the remainder got is even, ou time will change in its units to (p.m

Difference in minutes

45 – 30 = 15 minutes

Now get the difference of time and m

Hrs	***min***
10	*00*
-	*15*
9	***45pm***

The baby slept at 9:45pm

20. The length of a wire is 2cm. If it is increased in the ratio of 4:3. What is the new length of the wire?

$$\frac{New\ ratio}{Old\ ratio} \times Quantity$$

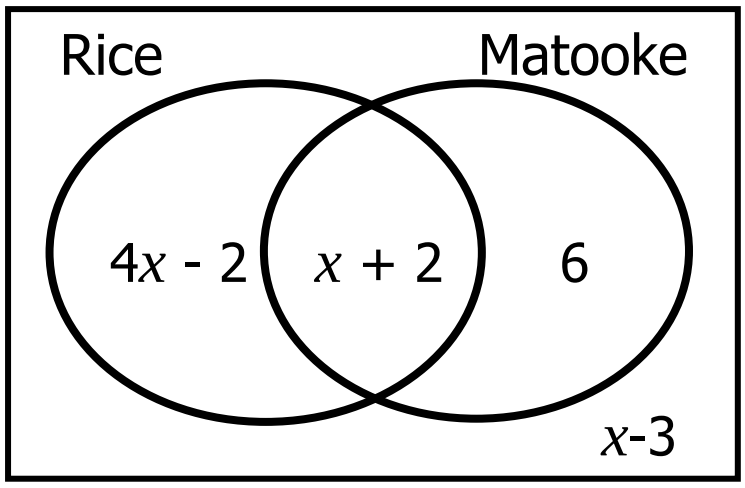
$$\frac{4}{3} \times 2cm$$

$$\frac{8cm}{3} = 2\frac{2}{3}cm$$

The new length of the wire is $2\frac{2}{3}cm$

SECTION B: 60 MARKS

21. The Venn diagram below shows the number of pupils who ate different meals at a certain party.



(a) If 35 pupils dislike Matooke, find the value of x. (02 Mark

$$4x - 2 + x - 3 = 35$$
$$4x + x - 2 - 3 = 35$$
$$5x - 5 = 35$$
$$5x - 5 + 5 = 35 + 5$$
$$5x = 40$$
$$\frac{5x}{5} = \frac{40}{5}$$
$$\boldsymbol{x = 8}$$

(b) Find the probability that a pupil picked at random likes only one type of meal. (02 Mark

Prob. = n (E) / *Expected outcome*
N(SS) Total outcomes

Expected outcome	***Total***
4x-2+6	*30+x+2+6+x-3*
(4x8-2)+6	*30+(8+2)+6+(8-3)*
32-2+6	*30+10+6+5*
30+6=36	***=51***

Probability $= \frac{36}{51}$

22. Juma sat for week 4 tests and scored as follows,

English 9 out of 10.
Science 64 out of 80.
Mathematics 35 out of 50.
SST 25 out of 30.

(a) Change all the marks for each subject to a percentage. (04 Marks)

English	***Science***	***Mathematics***	***SST***
$\frac{9}{10} \times 100$	$\frac{64^{8}}{80_{1}} \times 100$	$\frac{35}{50_{1}} \times 100^{2}$	$\frac{25}{30_{1}} \times 100$
90%	*80%*	*70%*	$83\frac{1}{3}\%$

(b) Work out the range of the percentage shared. (01 Mar

$$Highest - lowest$$
$$= 90\% - 70\%$$
$$= \mathbf{20\%}$$

23. Ben is11years older than Kyagulanyi. In 4 years' time, Ben will be twice as old as Kyagulanyi.

(a). How old is Kyagulanyi? (03 Mark

	Kyagulanyi	*Ben*
Now	***n***	***n+1***
4yrs	***n+4***	***n+11+4***

$$2(n+4) = n+11+4$$
$$2n+8 = n+15$$
$$2n-n = 15-8$$
$$\mathbf{n = 7}$$

Kyagulanyi is 7 years old.

(b). Find the difference in their age in 4 years' time. (02 Mark

In four years time
Kyagulanyi ***will be***
(n+4)yrs
(7+4)yrs
11years

Ben will be ***(n+15)****yrs*
(7+15)yrs
= ***22yrs***

Difference in age
(22-11) years.
= 11years

24. A businessman has 200bags of maize flour each weighing 50,000gramms.

(a) Find the total weight of the bags in Kilograms. (02 Marks)

Total number of bags = 200

Weight in grams.	*Weight in Kgs*
(200 x 50,000)g	$1kg = 1000g$
10,000,000g	$1\,g = \frac{1}{1000}\ kg$
	$10{,}000{,}000g = \left(\frac{1}{\cancel{1000}} \times 10{,}000{,}\cancel{000}\right)kg$
	= 10,000kg

(b) If a pick-up carries 2 tonnes per trip, workout the number of bags the pick-up will carry in one trip. (03 Marks)

1 trip has 2 tonnes

Total no. of kgs in the 2 tonnes.

1 tonne = 1000kg
2 tonnes = 2 x 1000kg
2 tonnes = 2000kg

Total no. of kg in one bag	*Number of bags*
$\left(\frac{50\cancel{000}}{1\cancel{000}}\right)kg$	$\left(\frac{2000}{50}\right)kg$
50kg	***40 bags***

(c) Find the number of trips the pick-up will make to transport the whole flour from the milling machine to his shop. (01 Mark)

1 trip	*2000kg*
10,000kg	$\left(\frac{10000}{2000}\right)trips$
	= 5 trips

25. (a) Write 402_{five} in words 01 Mark)

Four zero two base five

(b) Find the product of 101_{two} and 11_{two} (02 Mark

$$\begin{array}{r} 1\ 0\ 1_{two} \\ \times\ 1\ 1_{two} \\ \hline 1\ 0\ 1 \\ +1\ 0\ 1 \\ \hline 1\ 1\ 1\ 1_{two} \end{array}$$

26. After spending $\frac{1}{5}$ of her allowances on fees, Julian remained with sh.60,000.

(a) How much does Julian earn as allowances altogether? (03 Marks)

Spent fraction $= \frac{1}{5}$

Remaining fraction

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

$\frac{5}{5} - \frac{1}{5} = \frac{4}{5}$

Total allowances earned

$Sh.\ 60{,}000 \div \frac{4}{5}$

$Sh.\ 60000 \times \frac{5}{4}$

$Sh.\ 15000 \times 5$

Sh.75000

(b) What is $\frac{1}{2}$ of her allowances? (01 Mark)

$\frac{1}{2} \times Sh.\ 75000$

$\frac{1}{2} \times Sh.\ 75000$

Sh. 37500

27. (a) Express 0.0259 in standard form. (02 Marks)

0.0259 in the form $A \times 10^n$

$0.0259 \times 10 = 0.259$

$0.259 \times 10 = 2.59$

2.59×10^{-2}

(b) What number has been expanded to give, (02 Marks

$(9 \times 10^2) + (8 \times 10^0) + (2 \times 10^{-1}) + (3 \times 10^{-2})$?

$(9 \times 10^2) + (8 \times 10^0) + (2 \times 10^{-1}) + (3 \times 10^{-2})$

$900 + 8 + \frac{2}{10} + \frac{3}{100}$

$900 + 8 + 0.2 + 0.03$

$9\ 0\ 0.0$

8.0

0.2

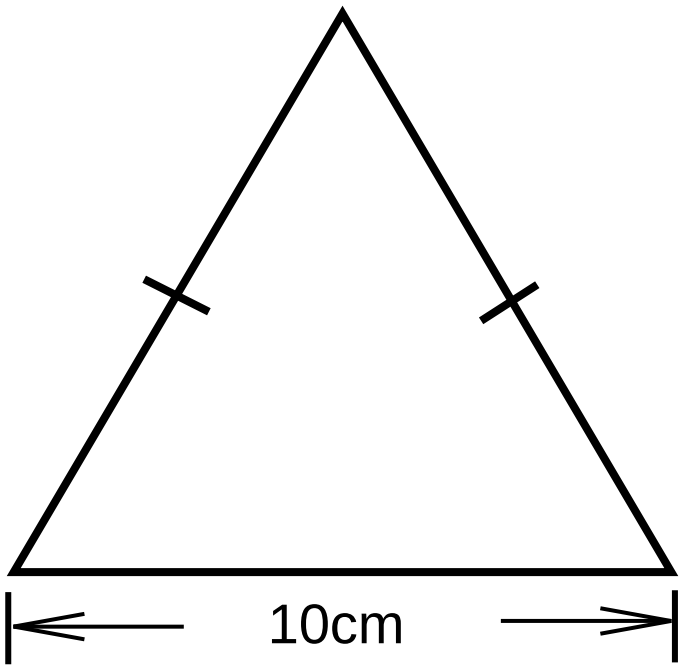
$+\ \ 0.03$

$\underline{\mathbf{9\ 0\ 8.23}}$

(c) Round off 26.95 to the nearest whole number. (02 Marks)

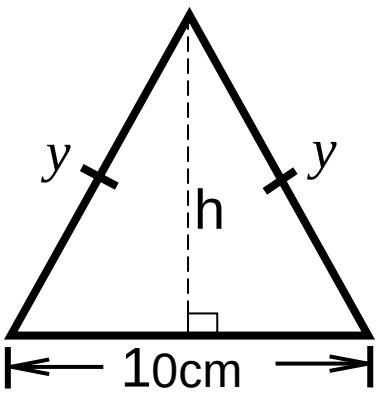
$$\begin{array}{r} 26.95 \\ +1 \\ \hline 27 \end{array}$$

28. The perimeter of an isosceles triangle below is 36cm. If its height is half the 13th even number.



(a) Find the value of each of its missing sides (04 Marks)

Let the missing sides be y



Perimeter = y + y +10cm

36cm = 2y+10cm

36cm-10cm = 2y+10cm-10cm

26cm = 2y

$\frac{26cm}{2} = \frac{2y}{2}$

13cm = y

The value of each missing sides is 13cm.

OR

Let the missing sides be y (opp sides are equal)

$S_1+S_2+S_3$= *perimeter*

y+y+10cm = 36cm

2y + 10cm = 36cm

2y + 10cm-10cm=36cm-10cm

2y=36cm

$\frac{2y}{2} = \frac{36}{2} cm$

y = 13cm

The height is half the 13th even number

Even numbers.

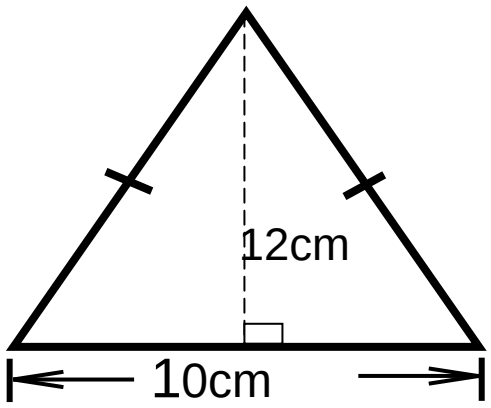
0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, ***24.***

The 13th even number is ***24.***

$$Height = \frac{1}{2} \times 24cm$$

$$= \mathbf{12cm}$$

(b) Calculate its area. (02 Marks)



$$Area = \frac{b \times h}{2}$$

$$= \frac{10cm \times 12cm}{2}$$

$$= \mathbf{60cm^2}$$

OR

$$A = \frac{1}{2} \times b \times h$$

$$A = \frac{1}{2_1} \times \cancel{10}^{5} cm \times 12cm$$

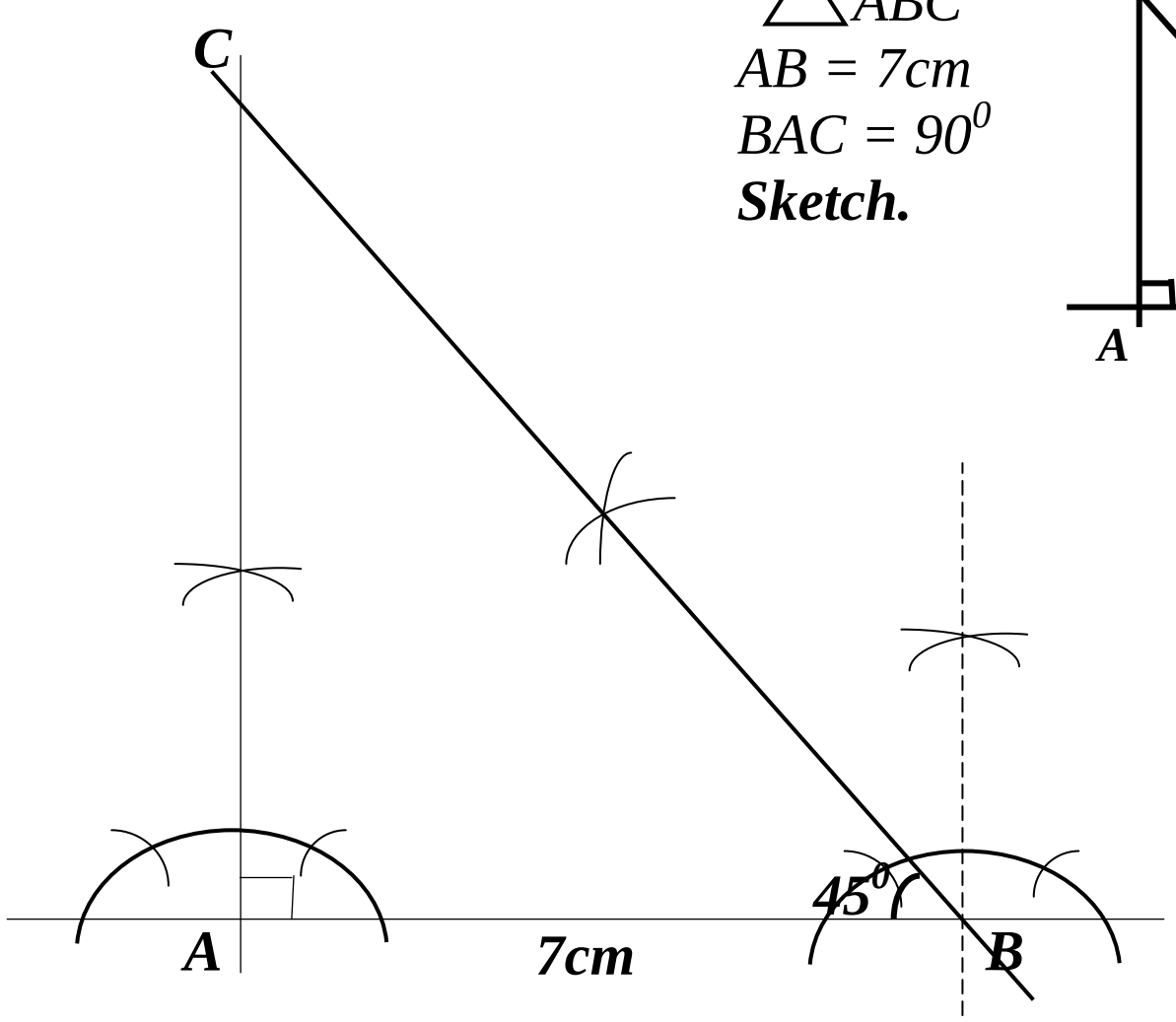
$$A = 5cm \times 12cm^2$$

$$\mathbf{A = 60cm^2}$$

29. Using a ruler and a pair of compasses only,

(a) Construct triangle ABC where AB = 7cm, angle BAC = 90^0 and angle CBA = 45^0. (04 Mark

Accurate diagram

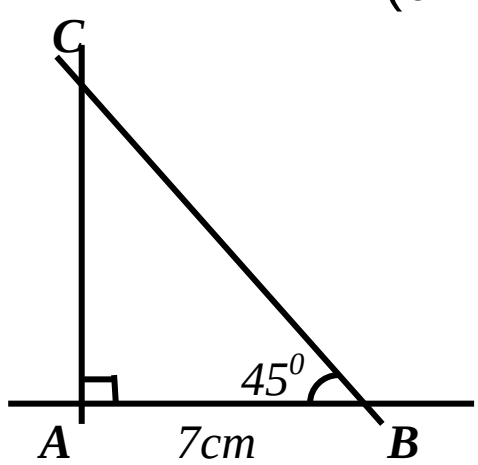


$\triangle ABC$

$AB = 7cm$

$BAC = 90^0$

Sketch.



(b) Measure the length CB. **9.6 /9.7 / 9.8** cm (01 mark)

30. In a football league, a win (W) earns 3 points, a draw (D) only 1 point and a loss (L) 0 point, All teams played equal games (P). The results for four football clubs in the Champions League are given in the table below.

Team	P	W	D	L	Pts
Man. City	6	**4**	0	2	12
PSG	6	3	**2**	1	**11**
Arsenal	6	2	1	3	**7**
Man.United	6	**1**	**1**	4	4

If a total of 34 points was accumulated by all the four teams at the end of the League, complete the table above. (06 Marks)

W = 3 POINTS
D = 1 POINT
L = 0 POINT

TOTAL POINTS = 34

MAN.CITY

Let the number of wins be x

Wins **+** ***Draws*** **+ *Losses*** **= *Earned points***
(x x *3points)* +*(0* x *1point)* + *(2* x *0point)* = *12points*

$$3x + 0 + 0 = 12$$
$$3x = 12$$
$$\frac{3x}{3} = \frac{12}{3}$$
$$x = 4 \text{ wins}$$

ARSENAL

Let the number of points be y

Wins **+** ***Draws*** **+ *Losses*** **= *Earned points***
(2 x *3points)* +*(1* x *1point)* + *(3* x *0point)* = *y points*

$$6 + 1 + 0 = y$$
$$y = 7 \text{ points}$$

PSG points
***34* – (12 + 7 + 4)**
34 – 23
= 11 points

PSG

Let the number of draws be y

Wins	+	***Draws***	+	***Losses***	=	***Earned points***
(3 x 3points)	+	*(y x 1point)*	+	*(1 x 0point)*	=	*11points*

$$9 + y + 0 = 11$$
$$y + 9 = 11$$
$$y + 9 - 9 = 11 - 9$$
$$y = 2 \text{ draws}$$

MAN. UNITED

P = 6 Pts = 4 L = 4 W = 1 D = 1

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31. Jane bought the following items from the market.

3kg of sugar at sh.3500@kg

1½kg of rice at sh. 3800 per kg

1½ litres of paraffin at sh.2400 per litre.

8 oranges at sh.250 per orange.

If Jane remained with sh.3,200, find the total amount of money she had at first. (05 Marks)

Sugar.

Sh.3500
× 3
Sh.10500

Rice.

$Sh.3800 \times 1\frac{1}{2}$

$Sh.3800 \times \frac{3}{2}$

Sh.5700.

Paraffin.

$Sh.2400 \times 1\frac{1}{2}$

$Sh.2400 \times \frac{3}{2}$

Sh.3600.

Oranges.

Sh 2500
× 8
Sh.2000

Total.

Sh.10500
Sh. 5700
Sh. 3600
Sh. 2000
Sh.21,800

Total amount Jane had at first.

Sh.21800
+ Sh. 3200
Sh.25000

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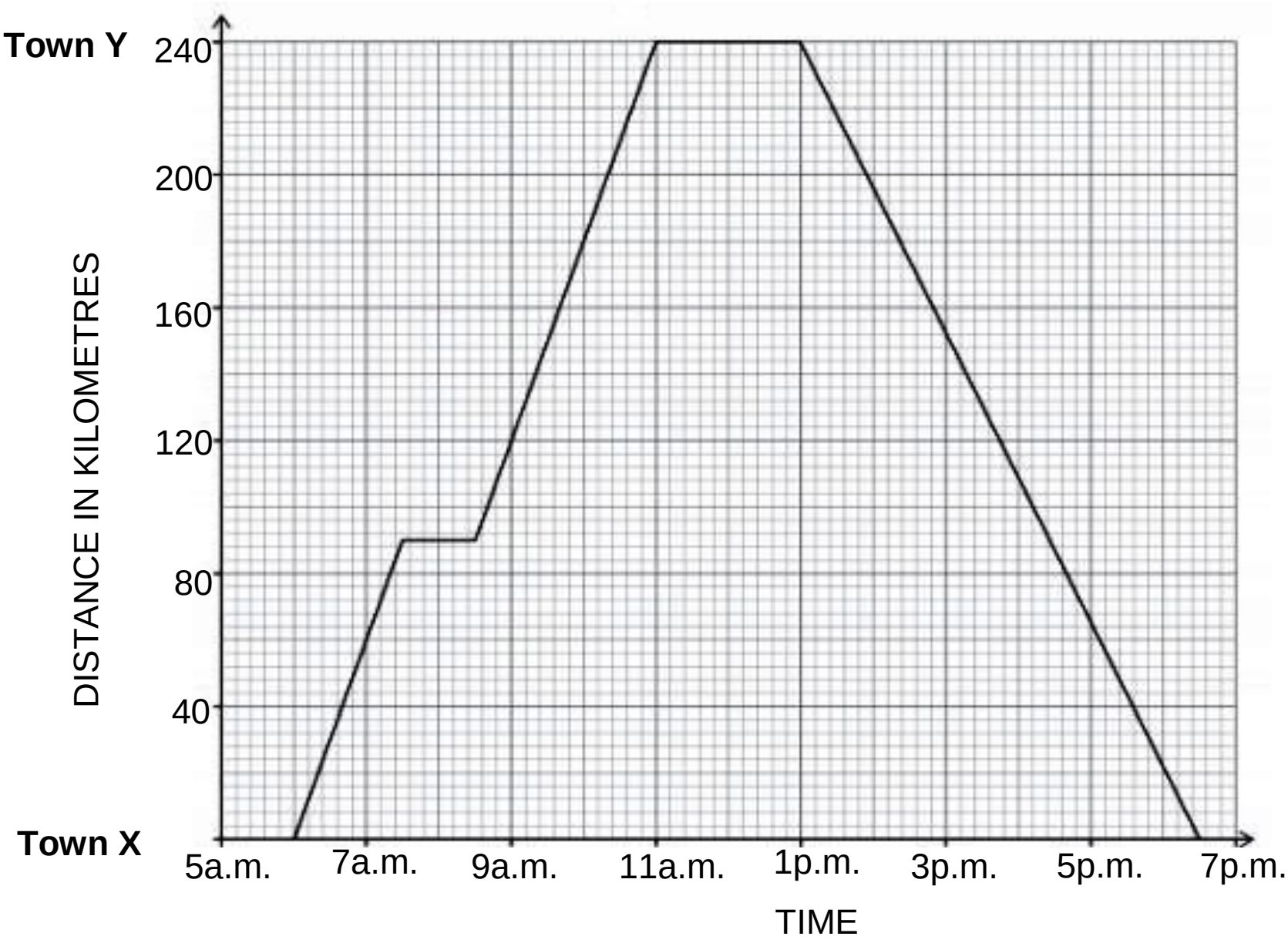
32. The graph below shows a journey by a bus from Town X to Town Y and back.



What was the average speed of the bus for the whole journey?
(05 Marks)

$$\textit{Average speed} = \frac{\textbf{Total distance moved}}{\textbf{Total time taken.}}$$

Scales

Horizontal

0 units represent 2 hours
1 unit represents 1 hour
1 smallest square unit rep.12minutes.

Vertical scale

2 square units rep.40km
1 square unit rep.20km
1 smallest square unit rep. 4km

$$\textit{Average speed} = \frac{\textbf{\textit{Total distance moved}}}{\textbf{\textit{Total time taken.}}}$$

$$\textbf{\textit{Average speed}} = \frac{240km + 240km}{1\frac{1}{2}\text{hr} + 1\text{hr}2\frac{1}{2}\text{hr} + 2\text{hr} + 5\frac{2}{3}}$$

$$= \frac{\textbf{\textit{480km}}}{\textbf{12}\frac{\textbf{2}}{\textbf{5}}\textbf{\textit{ hr}}}$$

$$= 480km \div 12\frac{2}{5}\text{hr}$$

$$= 480km \div \frac{62}{5}\,hr$$

$$= 480 \times \frac{5}{62}\,hr$$

$$= \frac{2400}{62}\,hr$$

$$= \frac{1200\ km/hr}{31}$$

$$= 38\ \frac{22}{31} km/hr \textbf{or}$$

$$\textbf{OR} = \textbf{38.7km/hr.}$$