

# Marking guide S.3 End of year 2023

SECTION A By: Mr. Byamagere Ronald  
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1)

$$t^2 - 7t + 12 = 0$$

$$\text{Product } 12 \quad \text{Sum } -7 \\ -4 \cdot 3$$

$$t^2 - 4t - 3t + 12 = 0 \quad M$$

$$t(t-4) - 3(t-4) = 0 \quad M$$

$$(t-3)(t-4) = 0 \quad M$$

$$\text{either } t-3 = 0 \Rightarrow t = 3 \quad A \\ \text{OR } t-4 = 0 \Rightarrow t = 4 \quad A$$

2.

$$(a) \begin{array}{r} 8 \\ \times 300 \\ \hline 240 \end{array} \quad (0)$$

$$\begin{array}{r} 3 \\ \times 6 \\ \hline 18 \end{array}$$

$$= 360 \text{ eight } A$$

$$(b) (3 \times 8^2) + (6 \times 8^1) + (0 \times 8^0) \\ = 192 + 48 + 0 = 240 \quad B$$

$$\text{Amount} = 240 \times 500$$

$$= \text{shs } 120,000 \quad A$$

$$3 \cdot 2 \begin{array}{r} 30 \\ \times 15 \\ \hline 40 \end{array}$$

$$2 \begin{array}{r} 15 \\ \times 15 \\ \hline 20 \end{array}$$

$$2 \begin{array}{r} 15 \\ \times 15 \\ \hline 10 \end{array} \quad M$$

$$3 \begin{array}{r} 15 \\ \times 15 \\ \hline 5 \end{array}$$

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

$$1 \begin{array}{r} 1 \\ \times 1 \\ \hline \end{array}$$

$$lcm = 2 \times 2 \times 2 \times 3 \times 5 = 120 \text{ mins.}$$

$$120 \text{ mins} = 2 \text{ hours.}$$

$$08:00$$

$$+ 2:00$$

$$10:00$$

$$\text{time} = 10:00 \text{ am. } B$$

$$4) \text{ Cost price} = \text{shs } 650,000$$

Selling price

$$= 650,000 + \frac{20 \times 650,000}{100}$$

$$= 650,000 + 130,000$$

$$= \text{shs } 780,000 \quad A$$

Paying price

$$= 780,000 - \left( \frac{5}{100} \times 780,000 \right) M$$

$$= 780,000 - 39,000$$

$$= \text{shs } 741,000 \quad A$$

$$5) \begin{array}{r} 2 \ 36 \\ 2 \ 18 \\ 3 \ 9 \\ 3 \ 3 \\ \hline 1 \end{array} \quad (2^3)^{2n} \times 3^m = 2^2 \times 3^2 \quad M$$

$$2^{6n} \times 3^m = 2^2 \times 3^2 \\ 6n = 2 \\ n = \frac{2}{6} = \frac{1}{3} \quad A$$

$$m = 2 \quad A$$

6)

Small test tube	bigger
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$$\text{Volume } V_s = 25 \text{ cm}^3 \quad V_b = 200 \text{ cm}^3$$

$$\text{length } L_s = 4 \text{ cm} \quad L_b = 1 \text{ cm.}$$

$$\text{Using } VSF = (L/F)^3$$

$$\frac{200}{25} = \left(\frac{y}{4}\right)^3 \quad M$$

$$\sqrt[3]{8} = \left(\frac{y}{4}\right)^3 \quad M$$

$$2 = \frac{y}{4}$$

$$y = 2 \times 4 = 8 \text{ cm. } A$$

$\therefore$  larger one = 8 cm long  $B$

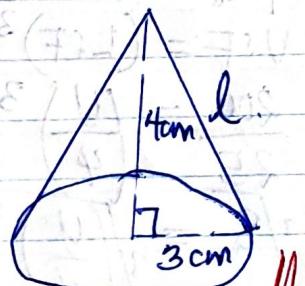
DR Rmnoo  
BMM  
888

$$\begin{aligned}
 7) & \frac{3+2\sqrt{5}}{1+\sqrt{5}} \\
 & = \frac{(3+2\sqrt{5})(1-\sqrt{5})}{(1+\sqrt{5})(1-\sqrt{5})} \\
 & = \frac{3(3-2\sqrt{5}) + 2\sqrt{5}(3-2\sqrt{5})}{1^2 - (\sqrt{5})^2} \\
 & = \frac{9-6\sqrt{5}+6\sqrt{5}-4\times 5}{1-5} \\
 & = \frac{9-20}{1-5} \\
 & = \frac{-11}{1-5} \\
 & = \frac{11}{5} \quad \text{Ans}
 \end{aligned}$$

$$\begin{aligned}
 7) & \frac{(3+2\sqrt{5})(1-\sqrt{5})}{(1+\sqrt{5})(1-\sqrt{5})} \\
 & = \frac{3-3\sqrt{5}+2\sqrt{5}-2\times 5}{1^2 - (\sqrt{5})^2} \\
 & = \frac{3-10-\sqrt{5}}{1-5} \\
 & = \frac{-7-\sqrt{5}}{-4} = \frac{7+\sqrt{5}}{4} \quad \text{Ans}
 \end{aligned}$$

$$P = \frac{7}{4}, q = \frac{1}{4}, r = 5 \quad \text{Ans}$$

$$8) S.A = \pi r(l+r)$$



$$l = \sqrt{4^2 + 3^2} = \sqrt{25} \quad l = 5 \text{ cm} \quad \text{Ans}$$

$$= \frac{22}{7} \times 3 (5+3) \quad \text{Ans}$$

$$= \frac{66}{7} \times 8$$

$$= 75.43 \text{ cm}^2 \quad \text{Ans}$$

$$\begin{aligned}
 9) & \bar{x} = \frac{\text{Sum of individual items}}{\text{Total number of items}} \\
 & = \frac{54+58+60+4+24}{5} = 56 \quad \text{Ans} \\
 & 172 + 3y = 280 \quad \text{Ans} \\
 & 3y = 280 - 172 \\
 & \frac{3y}{3} = \frac{108}{3} \quad \text{Ans} \\
 & y = 36 \text{ kg.} \quad \text{Ans}
 \end{aligned}$$

$$\begin{aligned}
 10) & \text{Using } (0, 3) \text{ and } (2, 0). \\
 & m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 3}{2 - 0} = -\frac{3}{2} \quad \text{Ans}
 \end{aligned}$$

Equation of boundary line

$$y = -\frac{3}{2}x + 3 \quad \text{Ans}$$

Testing: (0, 0) LHS:  $y=0$  RHS: 3.  
 $0 > 3$ . (false).

Inequality:

$$y \geq -\frac{3}{2}x + 3 \quad \text{Ans}$$

$$\begin{aligned}
 2y & \geq -3x + 6. \\
 2y + 3x & \geq 6.
 \end{aligned}$$

$$2y + 3x = 2 \times 5.8 \times 5.75 = 62.1$$

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$$2y + 3x = 0.80 + 0.75 = 0.55$$

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No. 11.

$$(a) \frac{83-32}{8} = \frac{51}{8} = 6.375 \approx 7$$

Marks	Tally	f	Cf	x	$fx$	
32-38		3	3	35	105	
39-45		5	8	42	210	
46-52		6	14	49	294	B1 - classes
53-59		13	27	56	728	
60-66		6	33	63	378	B1 - correct
67-73		4	37	70	280	B1 - Tallying and freq.
74-80		2	39	77	154	
81-87		1	40	84	84	M1 - fx
		$\sum f$			$\sum fx$	M1 - Cf
		40			2,233	M1 - Total

b). Modal class = 53-59.

B1

c) (i) Mean mark =  $\frac{\sum fx}{\sum f} = \frac{2,233}{40}$   
 $= 55.83$  marks

A1 Accept 55.8

$$(ii) = l_b + \left( \frac{\frac{A}{2} - Cf_b}{f_m} \right) C$$

Median class : = 53-59.

$$= 52.5 + \left( \frac{\frac{40}{2} - 14}{13} \right) 7.$$

M1

$$= 52.5 + \left( \frac{20 - 14}{13} \right) 7.$$

M1

$$= 52.5 + 1.2 \times 7  
= 52.5 + 14 = 66.5 \text{ marks}$$

A1

$$= 52.5 + 3.23$$

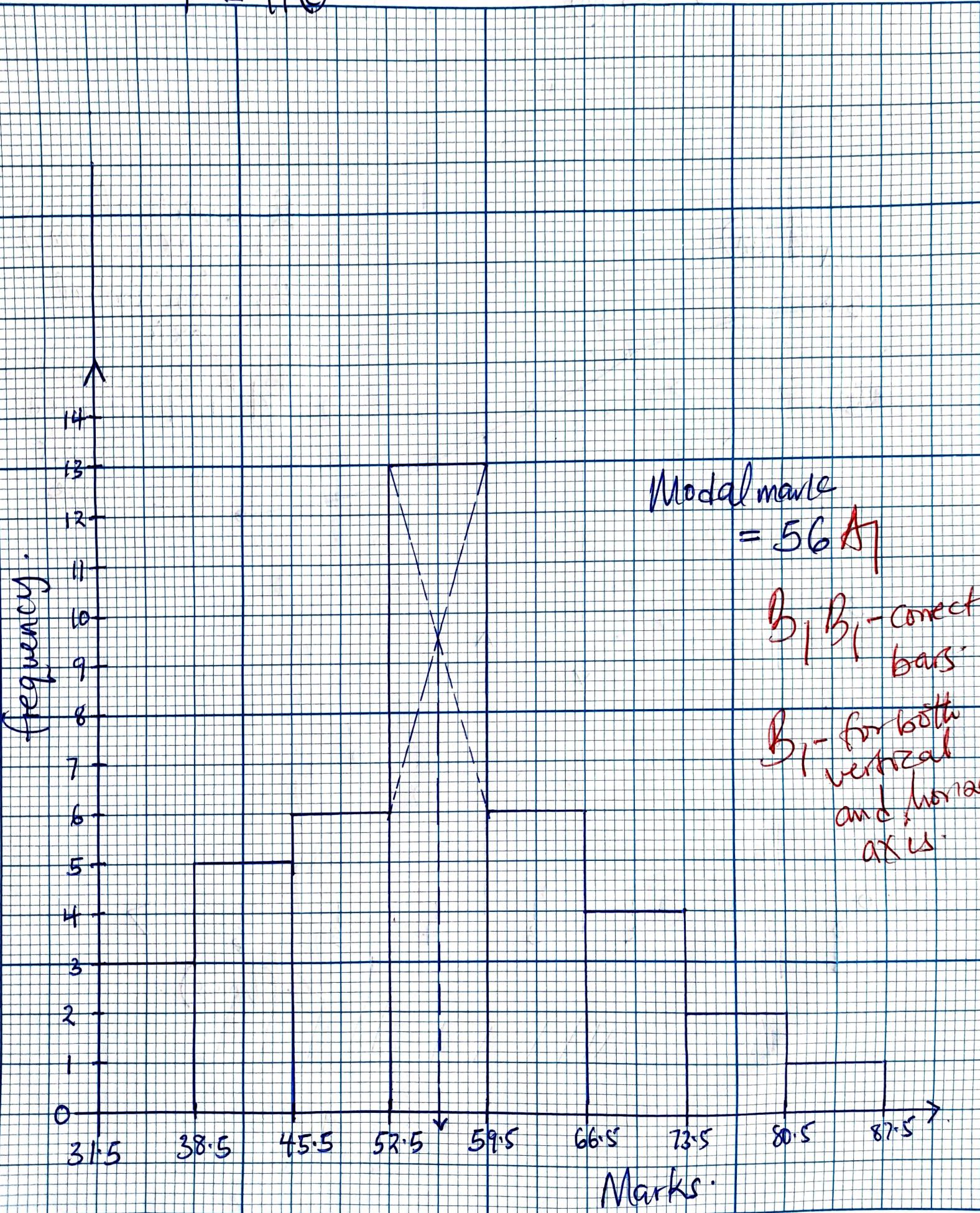
$$= 55.73$$

Subject Name

N O 11 (c)

Paper code

Personal Number



No 12.

(a) Let number of copies be  $n$ .

$$50,000 + 15,000n \leq 1,250,000$$

$$15,000n \leq 1,250,000 - 50,000$$

$$15,000n \leq 1,200,000$$

$$n \leq \frac{1,200,000}{15,000}$$

$$n \leq 80$$

∴ Maximum number of copies are 80.

b)

Amount shared by each

$$\text{Girl} = \frac{180,000}{x} \quad \text{Boy} = \frac{180,000}{2x}$$

$$\frac{180,000}{x} - \frac{180,000}{2x} = \frac{9,000}{1}$$

Multiply by  $2x$  both sides.

$$\frac{360,000}{x} - \frac{180,000}{x} = \frac{9,000 \times 2x}{1}$$

$$360,000 - 180,000 = 18,000x$$

$$\frac{180,000}{x} = 18,000x$$

$$x = \frac{180,000}{18,000}$$

$$x = 10$$

Number of boys

$$= 2 \times 10 = 20$$

M1

M1

M1

A1

B1

M1

M1

M1

M1

M1

M1

M1

A1

M1  
A1

15

N<sub>o</sub> 13

(a)  $y = 5 + \cos(30x)^\circ$

$x$	0	1	2	3	4	5	6	
$(30x)^\circ$	0	30	60	90	120	150	180	B <sub>1</sub>
$\cos(30x)^\circ$	1	0.87	0.5	0	-0.5	-0.87	-1	B <sub>1</sub>
5	5	5	5	5	5	5	5	B <sub>1</sub>
$y$	6	5.87	5.5	5	4.5	4.13	4	B <sub>1</sub> , B <sub>2</sub> B <sub>1</sub>

b) See graph.

c) i) from the

graph 4.78 m

Accept 4.77m, 4.79m 4.8m

ii) Time

= 2:30 am

A<sub>area</sub>  
B<sub>2</sub>

B<sub>2</sub>

$$0.2 = 2 + (1 + 8 + 11 + 5 - 3 + 1 + 4 + 5 + 5 + 0)$$

$$0.2 = 35 + 0.2$$

$$35 - 0.2 = 34.8$$

$$\frac{34.8}{2} = 17.4$$

$$\text{Substitute } 2 = 1 + P =$$

$$28 = 40 - 0.2 + 2 + 17.4 = 47.2$$

$$(X_{\text{min}} + X_{\text{max}}) / 2$$

$$28 = 15 + 13 + 0 =$$

Signature .....

Subject Name .....

N<sup>o</sup> 13 (6)

Paper code .....

Personal Number

$y$  (m)

6  
5  
4

3

2

1

0

0 1 2 3 4 5 6

$x$  (hours)

$B_1$  - vertical axis ( $y$ (m))  
 $B_1$  - horizontal axis  
 $B_1 B_1 B_1$  - correct plotted points  
 $B_1$  - curve

NQ 14(a)

$$n(E) = 60$$

$$n(M \text{ only}) = 10$$

$$n(W \text{ only}) = 11$$

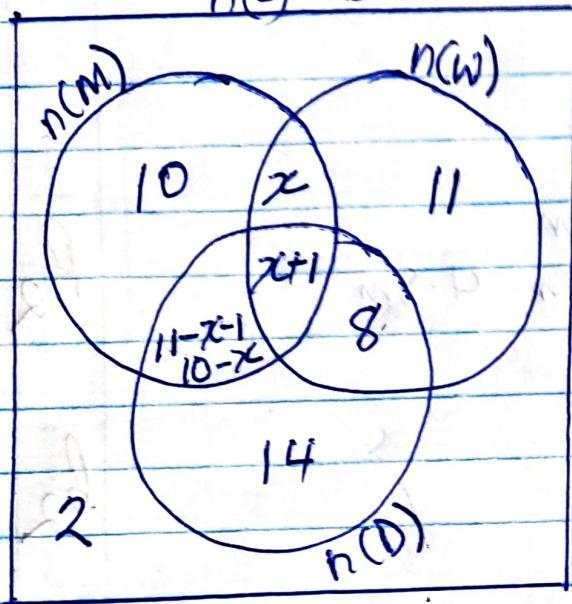
$$n(D \text{ only}) = 14$$

$$n(W \cap D \cap M) = 8$$

$$n(D \cap M) = 11$$

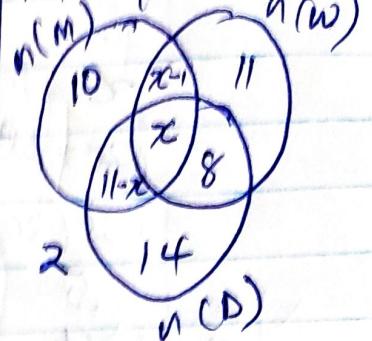
$$n(M \cap D \cap W) = n(M \cap W \text{ only}) + 1$$

$$n(E) = 60$$



$$n(W \cap D \cap M) = 2.$$

Accept



$$\begin{aligned}
 10 + x + 1 + x + 11 - x + 11 + 2 \\
 + 14 + 2 = 60 \\
 x = 60 - 55 = 5
 \end{aligned}$$

B<sub>4</sub>

- If all entries are correct.

B<sub>3</sub>

- If one is wrong

B<sub>2</sub>

- If two are wrong

B<sub>1</sub>

- If three are wrong

b) (i)

$$10 + x + x + 1 + 10 - x + 14 + 8 + 11 + 2 = 60$$

$$56 + x = 60$$

$$x = 60 - 56.$$

$$x = 4 \text{ students}$$

All the three clubs

$$= 4 + 1 = 5 \text{ students}$$

M

A

A

M/A

ii)

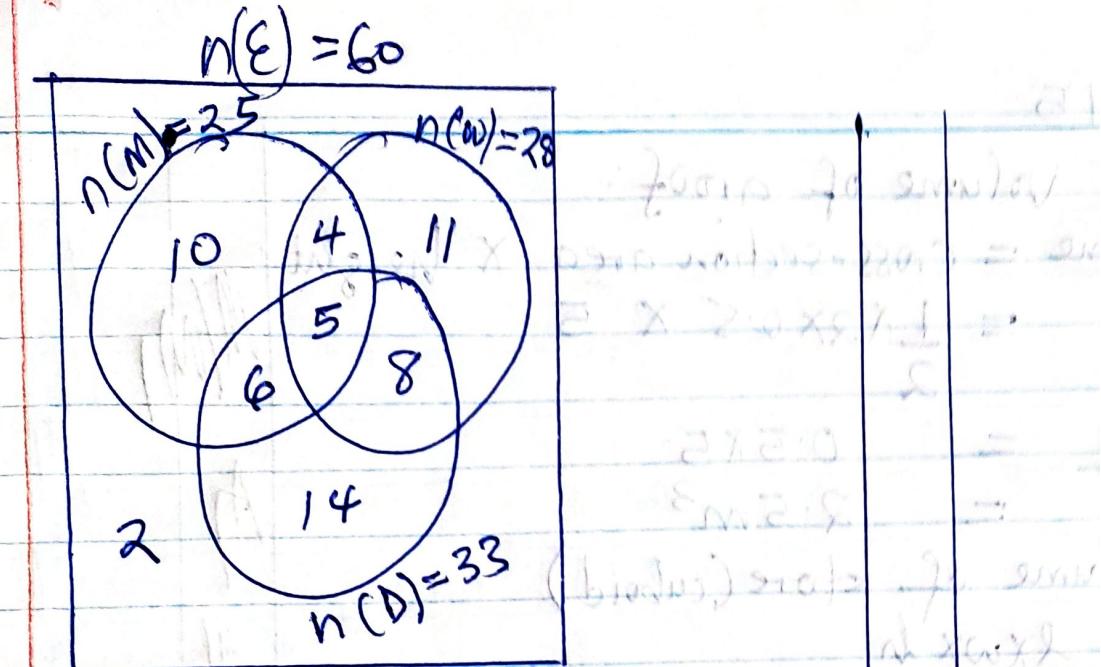
$$n(M) = 10 + 4 + 5 + 10 - 4 = 25$$

iii)

$$n(M \cup W \cup D')$$

$$= 10 + 4 + 11 = 25$$

M/A



c)  
i)

Only two clubs

$$= 6 + 4 + 8 = 18$$

$$\text{Probability} = \frac{18}{60}$$

$$= \frac{3}{10}$$

ii) Not more than one club

$$= 10 + 11 + 14 + 2$$

$$= 37$$

$$\text{Probability} = \frac{37}{60}$$

III

A

III/A

15

No 15.

a) Volume of a roof.

$$\begin{aligned}\text{Volume} &= \text{cross-section area} \times \text{height} \\ &= \frac{1}{2} \times 2 \times 0.5 \times 5.\end{aligned}$$

$$= 0.5 \times 5$$

$$= 2.5 \text{ m}^3.$$

Volume of store (cuboid)

$$V = l \times w \times h$$

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

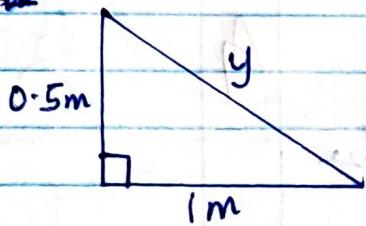
$$= 20 \text{ m}^3$$

Volume of the enclosed space

$$= 2.5 + 20 = 22.5 \text{ m}^3.$$

b) Total surface area of the roof.

\*



$$y^2 = 0.5^2 + 1^2$$

$$= 0.25 + 1$$

$$= \sqrt{1.25}$$

$$y = 1.12 \text{ cm.}$$

$$= 5 \times 1.12 \times 2$$

$$= 11.2 \text{ m}^2.$$

c) Number of iron sheets

$$\text{used} = \frac{11.2}{0.56}$$

$$= 20 \text{ iron sheets.}$$

d) Amount

$$= 20 \times 45,000$$

$$= \text{shs } 900,000$$

M/10/1

A/1

M/1

M/1

A/1

M/1

A/1

M/1

A/1

M/1

A/1

M/1

A/1

15