1ST MOCK MARKING SCHEME
MATHEMATICS

QUESTION 1

(a) $\frac{2}{3}\ of\ 6\frac{3}{4} \div \left(2\frac{4}{15} - 1\frac{2}{3}\right)$

$\frac{2}{3} \times \frac{27}{4} \div \left(\frac{34}{15} - \frac{5}{3}\right)$ **M1**

$\frac{9}{2} \div \left(\frac{34-25}{15}\right)$ **M1**

$\frac{9}{2} \div \left(\frac{9}{15}\right)$ **M1**

$\frac{9}{2} \times \frac{15}{9}$ **M1**

$\frac{15}{2} = 7\frac{1}{2}$ **M1**

(b) Gradient, m $= \frac{y_2 - y_1}{x_2 - x_1}$

$\frac{-1-5}{5--1}$ **M$\frac{1}{2}$**

$\frac{-6}{6} = -1$ **A$\frac{1}{2}$**

$y - y_1 = m(x - x_1)$

Using the gradient m, and any of the points

$y - 5 = -1(x - -1)$ **M1**

$y - 5 = -1(x + 1)$ **M$\frac{1}{2}$**

$$y - 5 = -x - 1 \qquad \mathbf{M\frac{1}{2}}$$

$$y = -x - 1 + 5 \qquad \mathbf{M1}$$

$$y = -x + 4 \qquad \mathbf{A1}$$

(c) $\frac{3}{x+1} - \frac{3}{x-1}$

$$= \frac{3(x-1)-3(x+1)}{(x+1)(x-1)} \qquad \mathbf{M1}$$

$$= \frac{3x-3-3x-3}{x^2-x+x-1} \qquad \mathbf{M1}$$

$$= \frac{-6}{x^2-1} \qquad \mathbf{M1}$$

Substituting $x = 2$

$$= \frac{-6}{2^2-1} \qquad \mathbf{M\frac{1}{2}}$$

$$= \frac{-6}{4-1} \qquad \mathbf{M\frac{1}{2}}$$

$$= \frac{-6}{3} = -2 \qquad \mathbf{A1}$$

QUESTION 2

(a) Discount = 15%

Original price = GH¢ 3000

New price $= \frac{100\% - discount}{100\%} \times$ GH¢ 3000

$$= \frac{100\%-15\%}{100\%} \times \text{GH¢ } 3000 \qquad \mathbf{M1\frac{1}{2}}$$

$$= \frac{85\%}{100\%} \times \text{GH¢ } 3000 \qquad \mathbf{M1}$$

$$= \text{GH¢ } 2250 \qquad \mathbf{A1\frac{1}{2}}$$

Therefore she paid GH¢ 2250 for the laptop

(b) $\frac{3}{4}(x+1) + 1 \leq \frac{1}{2}(x-2) + 5$

$$4 \times \frac{3}{4}(x+1) + 1 \times 4 \leq 4 \times \frac{1}{2}(x-2) + 5 \times 4 \qquad \mathbf{M2}$$

$$3(x+1) + 4 \leq 2(x-2) + 20$$

$$3x + 3 + 4 \leq 2x - 4 + 20 \qquad \mathbf{M1}$$

$3x - 2x \leq -4 + 20 - 4 - 3$ **M1**

$x \leq 9$ **A2**

(c) $|AB| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$= \sqrt{(4-1)^2 + (2--2)^2}$ **M1**

$= \sqrt{(3)^2 + (4)^2}$ **M1**

$= \sqrt{9 + 16}$ **M1** $\frac{1}{2}$

$= \sqrt{25}$ **M1** $\frac{1}{2}$

$|AB| = 5$ units **A2**

QUESTION 3

(a) (i)

Marks	Tally	Frequency
20 -29	/	1
30 -39	/	1
40 -49	//	2
50 -59	////	4
60 -69	~~///~~ ~~///~~ /	11
70 -79	~~///~~ ~~///~~	10
80 -89	////	4
90 - 99	//	2

$\sum fx = 35$ $\frac{1}{2}$ **mark for each = 4marks**

(ii) Number of candidates who ha 50 to 69 marks = 4+11 = 15 **M1**

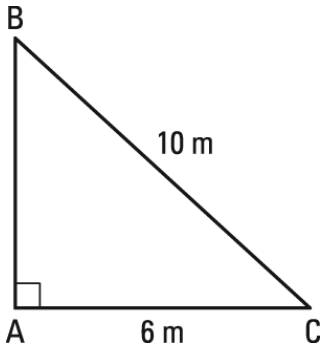
P(a candidate who had 50 to 69 marks) = $\frac{15}{35} = \frac{3}{7}$ **M1A1**

(b) Area of semi-circle = $\frac{1}{2}\pi r^2$

$= \frac{1}{2} \times \frac{22}{7} \times 42 \times 42$ **M1**

$= 2772\ cm^2$ **A2**

(c)



$|BC|^2 = |AB|^2 + |AC|^2$

$10^2 = |AB|^2 + 6^2$ **M1**

$100 = |AB|^2 + 36$ **M1**

$100 - 36 = |AB|^2$ **M1**

$64 = |AB|^2$

$\sqrt{64} = |AB|^2$ **M1**

$|AB| = 8cm$ **A1**

Therefore the wall is 8 cm far up

QUESTION 4

(a) $345.12 = 300 + 40 + 5 + \frac{1}{10} + \frac{2}{100}$ **M1**

$-154.18 = 100 + 50 + 4 + \frac{1}{10} + \frac{8}{100}$ **M1**

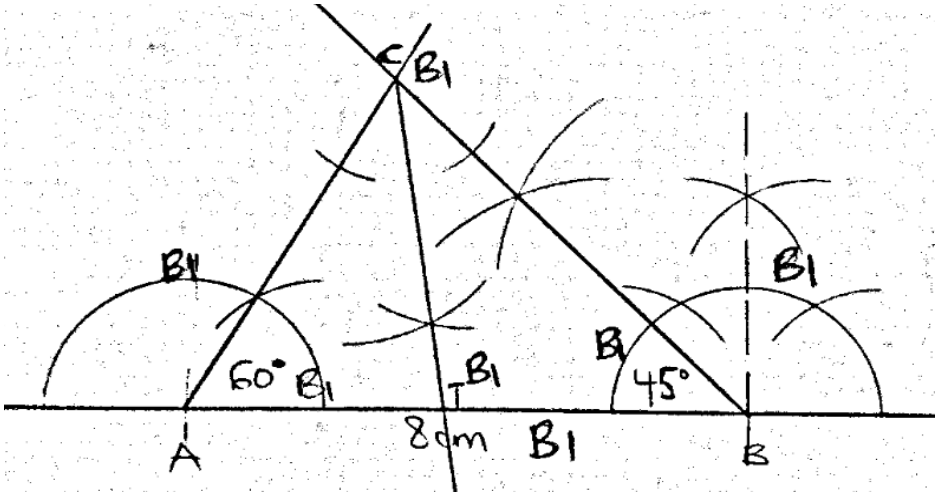
$190.94 = 100 + 90 + 0 + \frac{9}{10} + \frac{4}{100}$ **A2**

(b) $r = \frac{1}{2}\left[\begin{pmatrix}-2\\5\end{pmatrix} + \begin{pmatrix}-2\\-3\end{pmatrix}\right]$ **M1**

$r = \frac{1}{2}\begin{pmatrix}-4\\2\end{pmatrix}$ **M1**

$r = \begin{pmatrix}-2\\1\end{pmatrix}$ **M1**

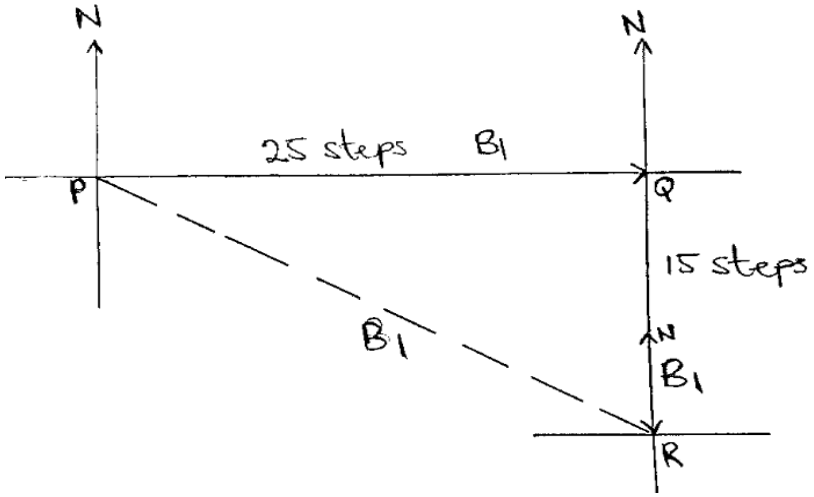
(c)



(iii) Angle CTB = 98° **A1**

QUESTION 5

(a)



(b) Let n(U) = total candidates = n(U) = 400

n(E) = number of candidates who wrote English = n(E) = 60%

n(M) = number of candidates who wrote Mathematics = n(M) = 78%

x = number of candidates who wrote both English and Mathematics

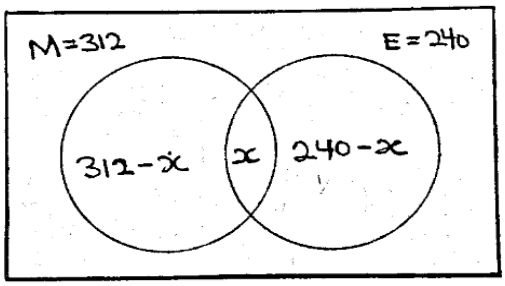
$n(M) = \frac{78\%}{100\%} \times 400$ **M1**

$= 312$ candidates **A$\frac{1}{2}$**

$n(E) = \frac{60\%}{100\%} \times 400$ **M1**

$= 240$ candidates **A$\frac{1}{2}$**

(i)



A2

(ii) $312 - x + x + 240 - x = 400$ **M1**

$552 - x = 400$

$552 - 400 = x$ **M1**

$152 = x$ **A1**

Therefore 152 candidates took both exams

(c) $\frac{0.084 \times 0.81}{0.027 \times 0.04} = \frac{84 \times 10^{-3} \times 81 \times 10^{-2}}{27 \times 10^{-3} \times 4 \times 10^{-2}}$ **M1**

$= \frac{84 \times 81 \times 10^{-5}}{27 \times 4 \times 10^{-5}}$ **M1**

$= 21 \times 3 \times 10^{-5+5}$ **M1**

$= 63$

$= 6.3 \times 10^{1}$ **A1**

QUESTION 6

(a) (i) **90˚ clockwise rotation**

$$\begin{pmatrix} x \\ y \end{pmatrix} \longrightarrow \begin{pmatrix} y \\ -x \end{pmatrix}$$

$$A\begin{pmatrix} 1 \\ 3 \end{pmatrix} \longrightarrow A_1\begin{pmatrix} 3 \\ -1 \end{pmatrix}$$

$$B\begin{pmatrix} 3 \\ 2 \end{pmatrix} \longrightarrow B_1\begin{pmatrix} 2 \\ -3 \end{pmatrix}$$

$$C\begin{pmatrix} 2 \\ 1 \end{pmatrix} \longrightarrow C_1\begin{pmatrix} 1 \\ -2 \end{pmatrix}$$

(i) 180˚ anticlockwise rotation

$$\begin{pmatrix} x \\ y \end{pmatrix} \longrightarrow \begin{pmatrix} -x \\ -y \end{pmatrix}$$

$$A\begin{pmatrix} 1 \\ 3 \end{pmatrix} \longrightarrow A_2\begin{pmatrix} -1 \\ -3 \end{pmatrix}$$

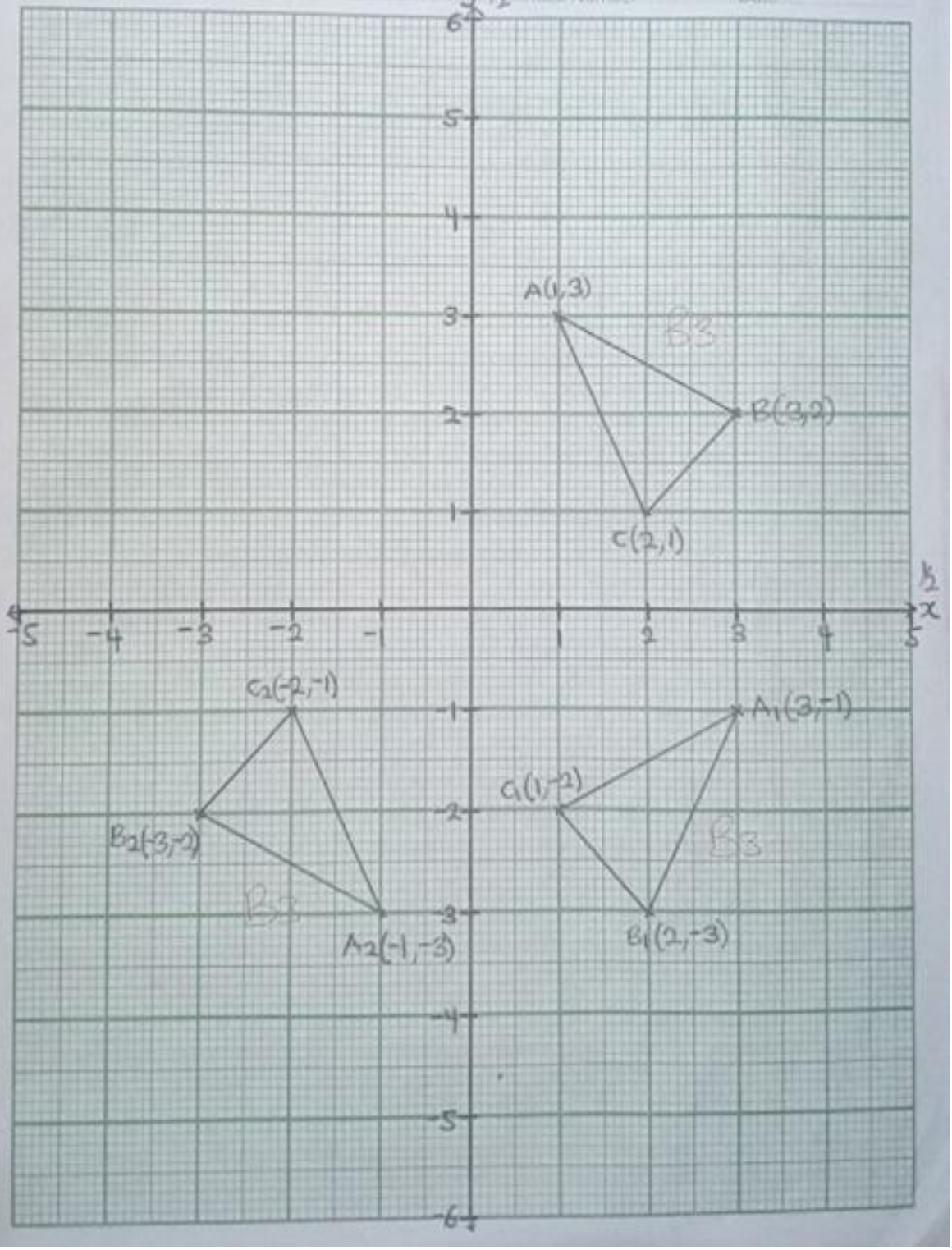
$$B\begin{pmatrix} 3 \\ 2 \end{pmatrix} \longrightarrow B_2\begin{pmatrix} -3 \\ -2 \end{pmatrix}$$

$$C\begin{pmatrix} 2 \\ 1 \end{pmatrix} \longrightarrow C_2\begin{pmatrix} -2 \\ -1 \end{pmatrix}$$

(To be fastened together with other answer sheet)

Q6(a)

Name: Index Number Date



(b) $\begin{pmatrix} x-2 \\ x-y \end{pmatrix} = \begin{pmatrix} 1 \\ 2x-1 \end{pmatrix}$ $M\frac{1}{2}$

$x - 2 = 1$ $M\frac{1}{2}$

$x = 1 + 2$ $M\frac{1}{2}$

$x = 3$ **A1**

$x - y = 2x - 1$

$but\ x = 3$

$3 - y = 2(3) - 1$ $M\frac{1}{2}$

$3 - y = 6 - 1$ $M\frac{1}{2}$

$3 - 6 + 1 = y$ $M\frac{1}{2}$

$y = -2$ **A1**

Therefore the value of $x$and $y = 3\ and\ -2$

OBJECTIVES

1. B	**11. A**	**21. B**	**31. A**
2. B	**12. A**	**22. C**	**32. B**
3. A	**13. C**	**23. A**	**33. D**
4. C	**14. B**	**24. B**	**34. A**
5. B	**15. D**	**25. D**	**35. A**
6. D	**16. A**	**26. C**	**36. D**
7. D	**17. A**	**27. A**	**37. D**
8. B	**18. B**	**28. C**	**38. A**
9. B	**19. B**	**29. B**	**39. B**
10. C	**20. A**	**30. B**	**40. D**