



EDUCATION-NEWS CONSULT – DODOWA, ACCRA

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EDUCATION-NEWS CONSULT MOCK – NOV 2023 EDITION FOR 2024 BECE

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1ST MOCK MARKING SCHEME MATHEMATICS

QUESTION 1

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

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

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

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

$$\frac{9}{2} \times \frac{15}{9} \quad \text{M1}$$

$$\frac{15}{2} = 7\frac{1}{2} \quad \text{M1}$$

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

$$\frac{-1-5}{5--1} \quad \text{M}\frac{1}{2}$$

$$\frac{-6}{6} = -1 \quad \text{A}\frac{1}{2}$$

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

Using the gradient m , and any of the points

$$y - 5 = -1(x - -1) \quad \text{M1}$$

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

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

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

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

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

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

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

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

Substituting $x = 2$

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

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

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

QUESTION 2

(a) Discount = 15%

Original price = GH¢ 3000

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

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

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

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

Therefore she paid GH¢ 2250 for the laptop

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

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

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

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

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

M1

$$x \leq 9$$

A2

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

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

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

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

$$= \sqrt{25} \quad \mathbf{M1 \frac{1}{2}}$$

$$|AB| = 5 \text{ units} \quad \mathbf{A2}$$

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

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

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

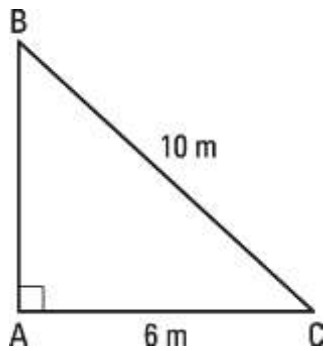
$$P(\text{a candidate who had 50 to 69 marks}) = \frac{15}{35} = \frac{3}{7} \quad \mathbf{M1A1}$$

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

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

$$= 2772 \text{ cm}^2 \quad \mathbf{A2}$$

(c)



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

$$10^2 = |AB|^2 + 6^2 \quad \text{M1}$$

$$100 = |AB|^2 + 36 \quad \text{M1}$$

$$100 - 36 = |AB|^2 \quad \text{M1}$$

$$64 = |AB|^2$$

$$\sqrt{64} = |AB| \quad \text{M1}$$

$$|AB| = 8 \text{ cm} \quad \text{A1}$$

Therefore the wall is 8 cm far up

QUESTION 4

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

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

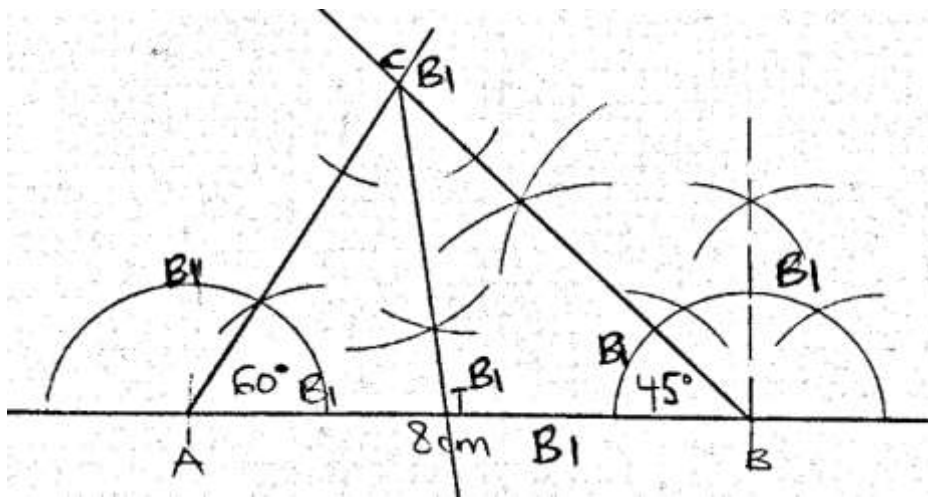
$$190.94 = 100 + 90 + 0 + \frac{9}{10} + \frac{4}{100} \quad \text{A2}$$

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

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

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

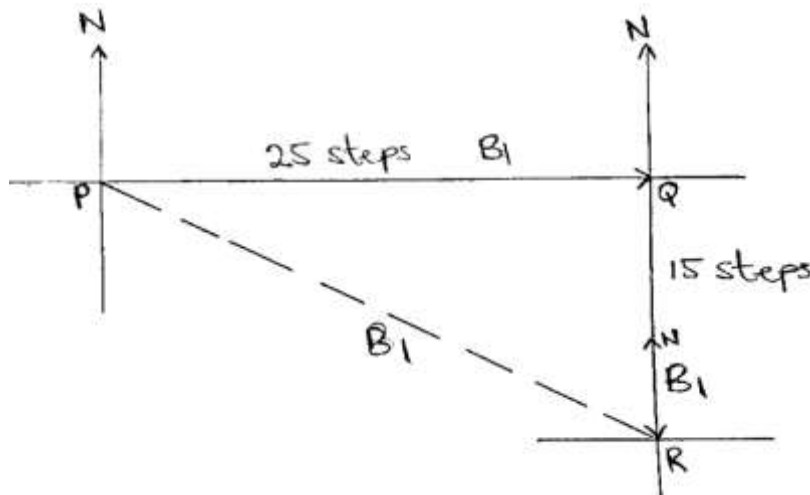
(c)



(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

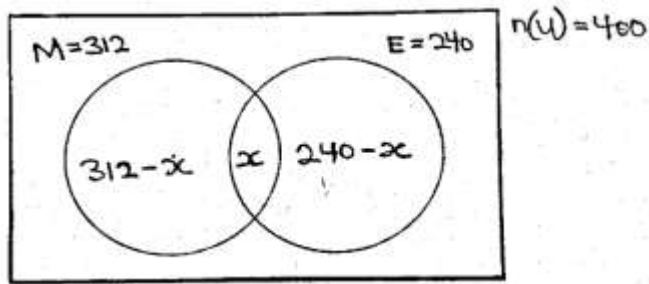
$$n(M) = \frac{78\%}{100\%} \times 400 \quad \text{M1}$$

$$= 312 \text{ candidates} \quad \text{A}_{\frac{1}{2}}$$

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

$$= 240 \text{ candidates} \quad \text{A}_{\frac{1}{2}}$$

(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

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

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

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

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

(i) 180° anticlockwise rotation

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

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

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

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

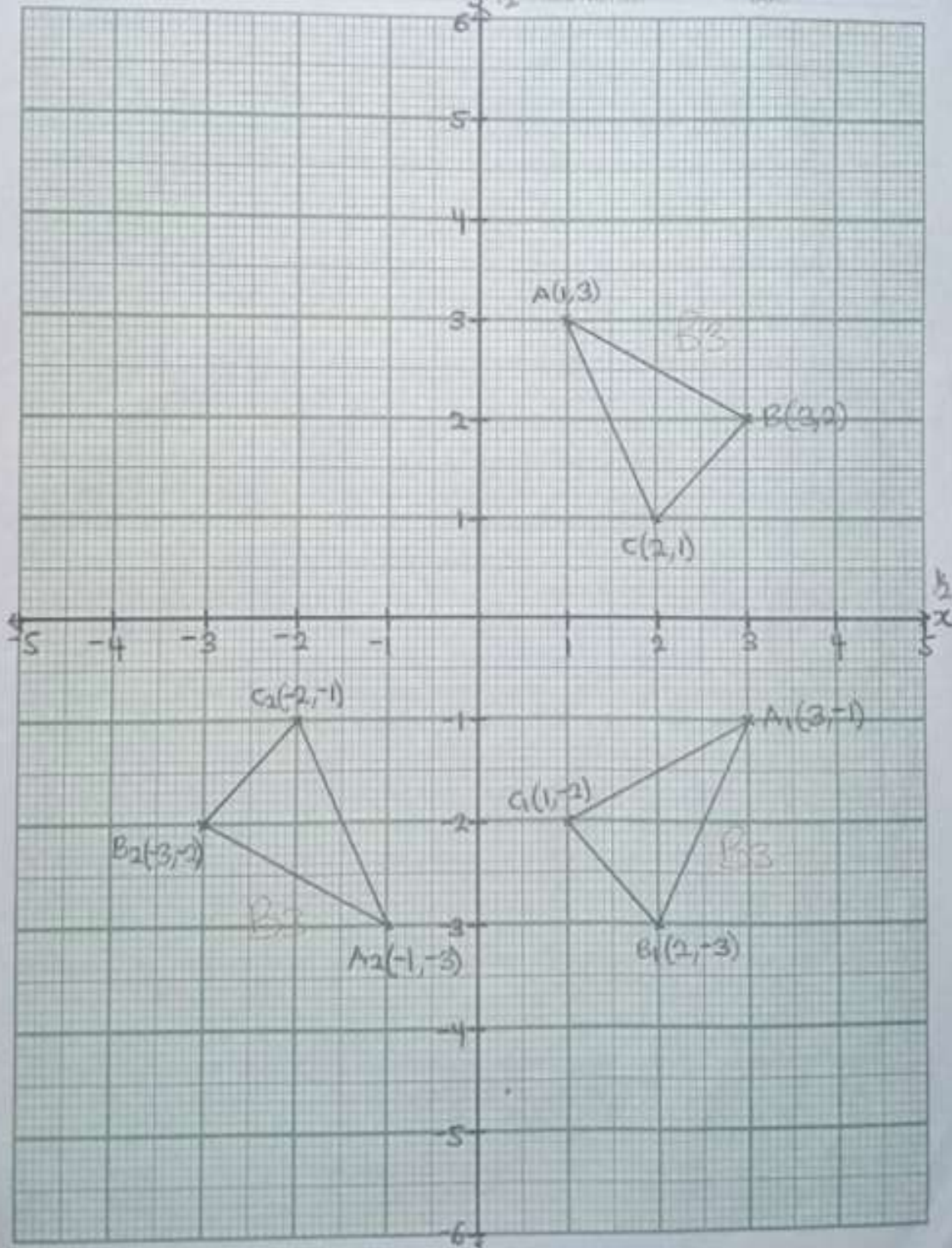
(To be fastened together with other answer sheet)

Q.6(a)

Name _____

Index Number _____

Date _____



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

$$x - 2 = 1 \quad M_{\frac{1}{2}}$$

$$x = 1 + 2 \quad M_{\frac{1}{2}}$$

$$x = 3 \quad A1$$

$$x - y = 2x - 1$$

$$\text{but } x = 3$$

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

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

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

$$y = -2 \quad A1$$

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