THE WEST AFRICAN EXAMINATIONS COUNCIL, ACCRA

BASIC EDUCATION CERTIFICATE EXAMINATION FOR SCHOOL CANDIDATES, 2025

FINAL MARKING SCHEME

MATHEMATICS 2

QUESTION NO.	SOLUTION	MARKS
1. (a) (i)	$U = \{2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, \ldots, 20\}$	
	$P = \{3, 6, 9, 12, 15, 18\}$	B1 (any omission B0)
	$Q = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}$	B1
	$P \cap Q = \{6, 12, 18\}$	M1 for at least 2 correct
		A1 for all correct
(ii)	*Subsets of* $P \cap Q$	
	$\{\ \}, \{6\}, \{12\}, \{18\}, \{6, 12\}, \{6, 18\}, \{12, 18\}, \{6, 12, 18\}$	B4 ($-\frac{1}{2}$ ee)
		-1 omission of { }
(b) (i)	$\frac{1}{y} = 3k - \frac{2}{x}$	
	$\frac{1(yx)}{y} = 3k(xy) - \frac{2(xy)}{x}$	M1 for clearing fractions
	$x = 3xyk - 2y$	
	$x = y(3xk - 2)$	M1 for factorising
	$\frac{x}{(3xk-2)} = \frac{y(3xk-2)}{(3xk-2)}$	M1 for dividing through by $(3xk-2)$
	$y = \frac{x}{3xk-2}$	A1 for $y = \frac{x}{3xk-2}$
(ii)	$x = -1,\ K = 2$	
	$y = \frac{-1}{3(-1)(2)-2}$	M1 for substituting
	$y = \frac{-1}{-6-2}$	M1 for simplifying $(-6-2)$ or its equivalence
	$y = \frac{1}{8}$	A1 for $y = \frac{1}{8}$
		[15 Marks]

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QUESTION NO.	SOLUTION	MARKS
1. (b) (i)	**ALITER** $\frac{1}{y} = 3k - \frac{2}{x}$ $\frac{1}{y} = \frac{3kx - 2}{x}$ $\frac{y}{1} = \frac{x}{3kx - 2}$ $y = \frac{x}{3kx - 2}$	M1 for R. H. S (denominator with one term in numerator correct) A1 for all correct M1 for inverting both sides A1 for $y = \frac{x}{3kx-2}$

for b(i)

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QUESTION NO.	SOLUTION	MARKS
2. (a)	$\frac{4000 \times 0.35}{0.05}$	
	$\frac{4 \times 10^3 \times 35 \times 10^{-2}}{5 \times 10^{-2}}$	M1 for converting 0.35 or 0.05 to whole numbers
		A1 for all correct
	$= 4 \times 7 \times 10^3$	M1 for simplifying
	$= 28 \times 10^3$	A1 for 28
	$= 2.8 \times 10^4$	A1 for 2.8×10^4
(b)	Amount received on type P	
	700,000 × 3	M1 for multiplying by 3
	GH¢2,100,000.00	A1 for GH¢2,100,000.00
	Commission received on type P $= \frac{10}{100} \times GH¢2,100,000$	
	GH¢210,000.00	A1 for GH¢210,000.00
	Amount received on type Q	
	1,400,000 × 4	M1 for multiplying by 4
	GH¢5,600,000.00	A1 for GH¢5,600,000.00
	Commission received on type Q	
	$= \frac{15}{100} \times GH¢5,600,000.00$	M1 for $\frac{15}{100} \times 5,600,000$
		M1 for simplifying with evidence (Cancellation)
	GH¢840,000.00	A1 for GH¢840,000.00
	Total Commission = GH¢210,000.00 + GH¢840,000.00	M1 for adding
	= GH¢1,050,000.00	A1 for GH¢1,050,000.00 (this where we want to see currency and 2dp)
	-1 ou/wu or 2 d. p. once only	[15 Marks]

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2. (b)	**ALITER**	
	Commission type P $= \frac{10}{100} \times 700{,}000$	M1
	$= GH¢70{,}000.00$	A1
	Commission type Q $= \frac{15}{100} \times 1{,}400{,}000$	M1
		M1 for evidence of multiplication
	$= GH¢210{,}000.00$	A1
	Commission on 3 type P $= 3 \times 70{,}000$	M1 for either 3P or 4Q
	$= GH¢210{,}000.00$	A1
	Commission on 4 type Q $= 4 \times 210{,}000$	
	$= GH¢840{,}000.00$	A1
	Total Commission $= 210{,}000 + 840{,}000$	M1
	$= GH¢1{,}050{,}000.00$	A1

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QUESTION NO.	SOLUTION	MARKS
3. (a) (i)	$\boldsymbol{a} = \begin{pmatrix}2\\3\end{pmatrix}$, $\boldsymbol{b} = \begin{pmatrix}x\\-3\end{pmatrix}$, $\boldsymbol{c} = \begin{pmatrix}7\\3\end{pmatrix}$	
	$\boldsymbol{c} = 2\boldsymbol{a} + \boldsymbol{b}$	
	$\begin{pmatrix}7\\3\end{pmatrix} = 2\begin{pmatrix}2\\3\end{pmatrix} + \begin{pmatrix}x\\-3\end{pmatrix}$	M1 for substituting $\boldsymbol{a}$, $\boldsymbol{b}$ and $\boldsymbol{c}$
	$\begin{pmatrix}7\\3\end{pmatrix} = \begin{pmatrix}4\\6\end{pmatrix} + \begin{pmatrix}x\\-3\end{pmatrix}$	
	$7 = 4 + x$	M1 for equating components
	$7 - 4 = x$	M1 for solving
	$x = 3$	A1 for $x = 3$
(ii)	$\mathbf{d} = \mathbf{c} - 3\boldsymbol{a}$	
	$= \begin{pmatrix}7\\3\end{pmatrix} - 3\begin{pmatrix}2\\3\end{pmatrix}$	M1 for substituting vector $\boldsymbol{a}$ and $\boldsymbol{c}$
	$= \begin{pmatrix}7\\3\end{pmatrix} - \begin{pmatrix}6\\9\end{pmatrix}$	
	$= \begin{pmatrix}7-6\\3-9\end{pmatrix}$	M1 for subtracting (to get 1 or -6)
	$= \begin{pmatrix}1\\-6\end{pmatrix}$	A1 for $\begin{pmatrix}1\\-6\end{pmatrix}$
(iii)	$\lvert\boldsymbol{d}\rvert = \sqrt{(1)^2 + (-6)^2}$	M1 for use of Pythagoras
	$= \sqrt{1 + 36}$	
	$= \sqrt{37}$units	A1 for $\sqrt{37}$units
(b) (i)	Volume of water used for cleaning	
	$= \frac{1}{5} \times 4500$	M1 for product
	$= 900$litres	A1 for 900 litres

any fraction seen will mean 'MOMOMOAO'

all must be correct

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QUESTION NO.	SOLUTION	MARKS
(ii)	Percentage of volume left in the tank	
	$4500 - 900 = 3600$ litres	M1 for subtracting A1 for 3600 litres
	$= \frac{3600}{4500} \times 100$	M1 for finding the percentage
	$= 80\%$	A1 for 80% [15 Marks]
	-1 ou/wu (litres)	
4. (a)	$I = \frac{5300 \times 9 \times 8}{100 \times 12}$	M1 for substituting into correct formula A1 for all correct
	$= 53 \times 6$	M1 for simplifying
	$= GH¢318.00$	A1 for GH¢318.00
(b) (i)	Let the land the father shared be x acres	B1 for $\frac{2}{5}x$
	First child $= \frac{2}{5}x$	B1 for $\frac{2}{5}x + 5$
	Second child $= \frac{2}{5}x + 5$	
	Third child $= 20$	M1 for L. H. S
	$\frac{2}{5}x + \frac{2}{5}x + 5 + 20 = x$	A1 for equation
		M1 for clearing fraction
	$2x + 2x + 25 + 100 = 5x$	
	$4x + 125 = 5x$	M1 for solving
	$5x - 4x = 125$	A1 for 125 acres
	$x = 125$ acres	

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QUESTION NO.	SOLUTION	MARKS
(ii)	First child share $= \frac{2}{5} \times 125$	M1 for multiplying by 125
	$= 50$ acres	A1 for 50 acres
	Second child share $= \frac{2}{5}x + 5$	
	$= 50 + 5$	M1 for adding
	55 acres	A1 for 55 acres
	-1 ou/wu or 2 d. p.	[15 Marks]
5. (a) (i)	Angle for fish	
	$= 360° - (54° + 90° + 36 + 108°)$	M1 for adding (any wrong inclusion no)
		A1 for 288
	$= 360 - 288$	M1 for subtracting
	$= 72°$	A1 for 72° (degree is not important) 4
(ii) (α)	Weight of flour	
	$= \frac{54}{360} \times 20$	M1
	$= \frac{54}{18}$	M1 for simplifying any simplifatu If you don't see it you ca
	$= 3kg$	A1 for $3kg$ 3
(β)	Weight of sugar as a percentage of weight of rice	
	$= \frac{36}{108} \times 100$	B1 for $\frac{36}{108}$
		M1 for finding percentage
	$= \frac{100}{3}$	M1 for simplifying
	$= 33.33$	
	$= 33.3$	A1 for 33.3 (2 decimal places) 4

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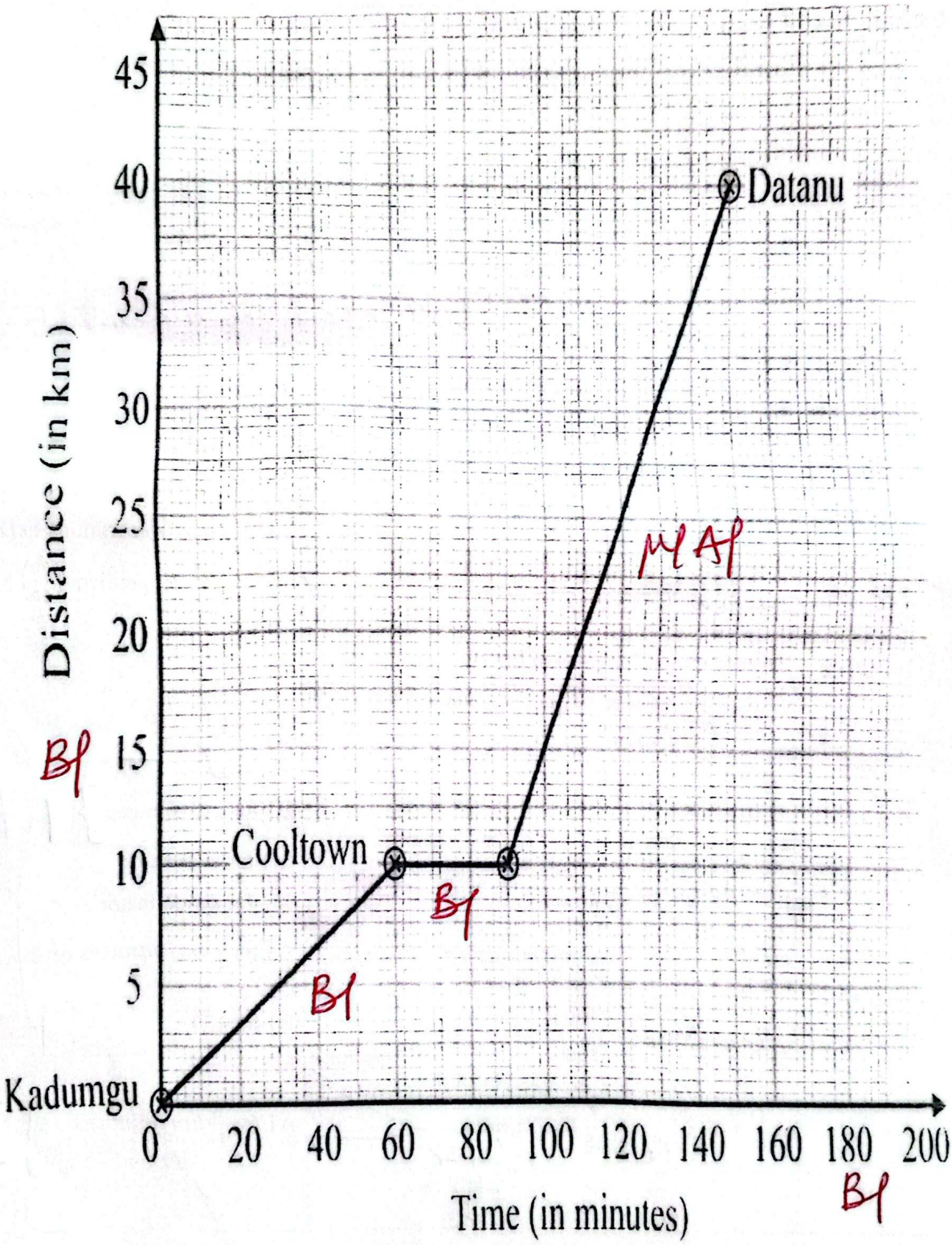
QUESTION NO.	SOLUTION	MARKS
(b)	Student not wearing glasses = 30 − 5	B1 for 25 with evidence of subtraction
	= 25	B0 for 5 without 30−5
	P(not wearing glasses) = $\frac{25}{30}$	M1 for $\frac{25}{30}$
		M1 for simplifying (showing Cancellation)
	= $\frac{5}{6}$	A1 for $\frac{5}{6}$ (
	B0M1M1A0 for work without 30−5	[15 Marks]
6. (a)	Axes	B1 $-\frac{1}{2}$ee for x-axis
	A line drawn from Kadumgu to Cooltown	B1 $-\frac{1}{2}$ee for y-axis (Distance Time)
	A line drawn during rest at Cooltown	B1 for line with correct gradient $\left(\frac{10}{60}\right)$
	A line drawn from Cooltown to Datanu	B1 for line from 60mins to 90mins
		M1 for line from 90mins to Datanu
		A1 for correct gradient $\left(\frac{30}{60}\right)$
(b) (i)	Distance from Cooltown to Datanu	
	= 40km − 10km or counting from graph	M1
	= 30km	A1
(ii)	150 minutes	B1 for 150 minutes
(iii)	$Average\ Speed = \frac{30km}{60minutes}$	M1 for numerator
		M1 for denominator
	$= \frac{1}{2}km/minutes$ or 30km/h	A1 for $\frac{1}{2}km/minutes$ or 30km/h
(c)	$Average\ Speed = \frac{40}{150}$	B1 for 150
		M1 for ratio
	$= \frac{4}{15}km/minutes$	A1 for $\frac{4}{15}km/minutes$
	After $\frac{40}{2\frac{1}{2}}$	[15 Marks]

8 $\frac{40 \times 2}{5}$ = 16km/h


Distance (in km)
45
40
35
30
25
20
15
10
5
0
20
40
60
80
100
120
140
160
180
200
Time (in minutes)
Datanu
Cooltown
Kadumgu
B1
M1A1
B1
B1
B1

6 marks