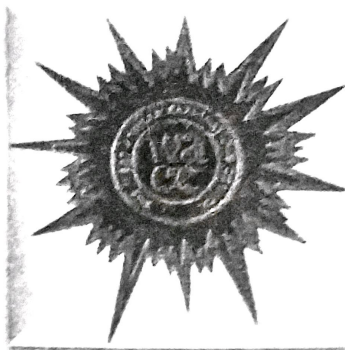


THE WEST AFRICAN EXAMINATIONS COUNCIL



**BECE FOR SCHOOL AND PRIVATE
CANDIDATES, 2022**

MATHEMATICS 2

FINAL MARKING SCHEME

THE WEST AFRICAN EXAMINATIONS COUNCIL, ACCRA

BASIC EDUCATION CERTIFICATE EXAMINATION

FOR SCHOOL AND PRIVATE CANDIDATES, 2022

FINAL MARKING SCHEME FOR MATHEMATICS 2

QUESTION NUMBER	SOLUTION	MARKS
1.	(a) (i) $P = \{1, 2, 3, 4, 6, 9, 12, 18, 36\}$ $Q = \{1, 2, 3, 6, 9, 18, 27, 54\}$ (ii) (α) $P \cap Q = \{1, 2, 3, 6, 9, 18\}$ (β) $n(P \cap Q) = 6$ (γ) HCF of 36 and 54 is 18 (b) 1, 4, 9, <u>16</u>, <u>25</u> <i>1st 2nd</i> (c) $6 = \frac{4m-3+3m+1}{2}$ $6 \times 2 = 7m - 2$ $12 + 2 = 7m$ $14 = 7m$ $m = 2$	M1 (at least 5 correct) A1 M1 (at least 3 correct) A1 M1 (at least 3 correct) A1 B1 B1 B1B1 M1 (R.H.S) A1 for equating to 6 M1 for clearing fraction M1 for solving A1 for 2 [15 MARKS]

Any strange number — A not

BASIC EDUCATION CERTIFICATE EXAMINATION
FOR SCHOOL AND PRIVATE CANDIDATES, 2022
MARKING SCHEME FOR MATHEMATICS 2

QUESTION NUMBER	SOLUTION	MARKS
2.	(a) $\left(\frac{1}{3} + \frac{1}{12}\right) \div \left(\frac{2}{3} - \frac{5}{8}\right) = \left(\frac{4+1}{12}\right) \div \left(\frac{16-15}{24}\right)$ $= \left(\frac{5}{12}\right) \div \left(\frac{1}{24}\right)$ $= \frac{5}{12} \times \frac{24}{1}$ $= 5 \times 2$ $= 10$ (b) $(2x-3)(2x+3)$ $2x(2x+3) - 3(2x+3)$ $4x^2 + 6x - 6x - 9$ — At least 3 terms $4x^2 - 9$ M1M1A1 (c) $3x+2=11$ $3x=11-2$ M1 $3x=9$ $x=3$ A1 for 3 $2y+3=11$ M1 $2y=11-3$ $2y=8$ $y=4$ A1 for 4 $(x+y)=3+4$ $=7$ A1 for 7	M1M1A1 M1 for any correct M1 for inverting & multiplying M1 for simplifying A1 for 10 M1 M1 A1 M1 A1 for 3 M1 A1 for 4 A1 for 7 [15 marks]

1st M1 — any of the LCM correct

2nd M1 — any of the numerators correct

BASIC EDUCATION CERTIFICATE EXAMINATION
FOR SCHOOL AND PRIVATE CANDIDATES, 2022
MARKING SCHEME FOR MATHEMATICS 2

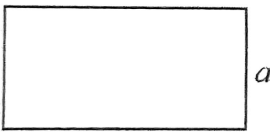
QUESTION NUMBER	SOLUTION	MARKS
3. (a)(i)	$L = \frac{2(m^2 - n^2)}{4(m+n)}$ $= \frac{2(m+n)(m-n)}{4(m+n)} \quad \text{— one factor correct}$ $= \frac{2(m-n)}{4}$ $= \frac{m-n}{2}$	M1 for factorizing numerator M1 for simplification
(ii)	$= \frac{2-3}{2}$ $= -\frac{1}{2}$ Or $L = \frac{2(2^2 - 3^2)}{4(2+3)}$ $= \frac{2(4-9)}{4(5)}$ $= \frac{2(-5)}{4(5)}$ $= -\frac{1}{2}$	A1 M1 for substituting A1 for $-\frac{1}{2}$ Or M1 for substituting A1 for $-\frac{1}{2}$
(b)	$\frac{4}{3x} = 7 - \frac{3}{x}$ $\frac{4}{3x} \times 3x = 7 \times 3x - \frac{3}{x} \times 3x$ $4 = 21x - 9 \quad \text{(any two terms correct)}$ $4 + 9 = 21x$ $13 = 21x$ $x = \frac{13}{21}$	M1 for clearing fraction M1 for solving A1

BASIC EDUCATION CERTIFICATE EXAMINATION
FOR SCHOOL AND PRIVATE CANDIDATES, 2022
MARKING SCHEME FOR MATHEMATICS 2

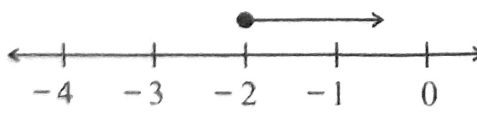
QUESTION NUMBER	SOLUTION	MARKS
3 (c)	Total sale of 12 textbooks $= 12 \times 25$ $= (10 + 2) \times 25$ $= 10 \times 25 + 2 \times 25$ $= 250 + 50$ $= \text{GH¢} 300.00$ Total cost of 3 calculators $= 3 \times 50$ $= \text{GH¢} 150.00$ Total cost of 8 packets of pen $= 8 \times 50$ $= \text{GH¢} 400.00$ Total sales $= 300 + 150 + 400$ $= \text{GH¢} 850.00$ Commission $= 5\frac{1}{2}\%$ of 850 $= \frac{11}{2} \times \frac{1}{100} \times 850$ $= \frac{11}{100} \times 425$ $= \frac{4675}{100}$ $= \text{GH¢} 46.75$ -1 ou/wu/2dp	B1 B1 B1 B1 M1 M1 for simplifying A1 [15 marks]

Insist on 2dp

**BASIC EDUCATION CERTIFICATE EXAMINATION
FOR SCHOOL AND PRIVATE CANDIDATES, 2022
MARKING SCHEME FOR MATHEMATICS 2**

QUESTION NUMBER	SOLUTION	MARKS
4. (a)(i)	$\text{Fred 4 years ago} = (x - 1) - 4 \quad (-4)$ $= x - 1 - 4$ $= (x - 5) \text{ years}$	M1 either A1 B1
(ii)	$\text{Fred 8 years from now} = (x - 1) + 8 \quad (+8)$ $= x - 1 + 8$ $= (x + 7) \text{ years}$	B1
(iii)	$x + 7 = 3(x - 5) \quad \text{any one correct}$ $x + 7 = 3x - 15 \quad \text{removing bracket}$ $7 + 15 = 3x - x$ $22 = 2x$ $x = 11$ $\text{His age now} = 11 - 1$ $= 10 \text{ years}$	M1 for equating M1 for solving removing bracket M1 for solving A1 for $x = 11$ A1 for = 10 years
(b)(i)	Let a = the width  $a + a + \frac{5}{2}a + \frac{5}{2}a = 497$ $2a + 5a = 497$ $7a = 497$ $a = \frac{497}{7}$ $= 71 \text{ km}$	M1 for correct sum A1 M1 for solving M1 for dividing by 7 A1 for 71 km
(ii)	$\text{Length} = \frac{5}{2} \times 71$ $= \frac{355}{2}$ $= 177.5 \text{ km}$ -1 ou/wu	M1 M1 for simplifying (evidence) A1 for 177.5km
		[15 marks]

**BASIC EDUCATION CERTIFICATE EXAMINATION
FOR SCHOOL AND PRIVATE CANDIDATES, 2022
MARKING SCHEME FOR MATHEMATICS 2**

QUESTION NUMBER	SOLUTION	MARKS
5.	(a) $(x-y)(3m+n) - (x-y)(m-2n)$ $(x-y)[(3m+n) - (m-2n)]$ <i>(x-y)</i> $(x-y)[3m+n-m+2n]$ <i>other terms</i> $(x-y)(2m+3n)$ (b) $p-q = \begin{pmatrix} 2-3x \\ 5-2y \end{pmatrix} - \begin{pmatrix} -1 \\ 5 \end{pmatrix} = \begin{pmatrix} 6 \\ 8 \end{pmatrix}$ $\begin{pmatrix} 6 \\ 8 \end{pmatrix} = \begin{pmatrix} 3-3x \\ -2y \end{pmatrix}$ $6 = 3-3x$ $3x = 3-6$ $3x = -3$ $x = -1$ $8 = -2y$ $y = -4$ $(x+y) = -1-4$ $= -5$ (c)(i) $\frac{x-1}{2} \leq \frac{1}{2} + x$ $\left(\frac{x-1}{2}\right) \times 2 \leq \frac{1}{2} \times 2 + x \times 2$ $x-1 \leq 1+2x$ $-1-1 \leq 2x-x$ $\{x \geq -2\}$ (ii)  <i>at least -2 and one arrow</i>	M1 for factorizing $(x-y)$ A1 M1 for simplifying A1 M1 for correct substitution M1 simplifying one component correct M1 for solving for x or y A1 A1 M1 for adding A1 M1 for clearing fraction M1 for solving A1 for $\{x \geq -2\}$ - <i>insist on curly bracket</i> B1

[15 marks]

**BASIC EDUCATION CERTIFICATE EXAMINATION
FOR SCHOOL AND PRIVATE CANDIDATES, 2022
MARKING SCHEME FOR MATHEMATICS 2**

QUESTION NUMBER	SOLUTION	MARKS																		
6. (a)	<table><tr><td>x</td><td>-3</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>y</td><td>11</td><td>(9)</td><td>(7)</td><td>5</td><td>(3)</td><td>1</td><td>(-1)</td><td>-3</td></tr></table>	x	-3	-2	-1	0	1	2	3	4	y	11	(9)	(7)	5	(3)	1	(-1)	-3	B2 $(-\frac{1}{2}ee)$
x	-3	-2	-1	0	1	2	3	4												
y	11	(9)	(7)	5	(3)	1	(-1)	-3												
(b)																				
(c)(i)	correct label of x – axis correct label of y – axis correct plotting of points	B1 $-\frac{1}{2}ee$ B1 $-\frac{1}{2}ee$ B3 $-\frac{1}{2}ee$																		
(ii)	drawing a straight line through all the points	B1																		
(d)(i)	$y = 10.2 \pm 0.2$	M1A1																		
(ii)	$x = 3.9 \pm 0.1$	M1A1																		
(iii)	Using any two points. Eg (2, 1) and (-1, 7) or right-angled triangle on graph Gradient = $\frac{7-1}{-1-2}$ $= \frac{6}{-3}$ $= -2$	M1 M1 for simplifying A1 [15 marks]																		

1. *[Signature]* 10/11/2022 7

2. *[Signature]* 10/11/2022

2. *[Signature]* 10/11/2022