

SAYO

**THE WEST AFRICAN EXAMINATIONS
COUNCIL**



**BASIC EDUCATION CERTIFICATE
EXAMINATION FOR SCHOOL
CANDIDATES – JUNE, 2024**

MATHEMATICS 2

FINAL MARKING SCHEME

THE WEST AFRICAN EXAMINATIONS COUNCIL, ACCRA

BASIC EDUCATION CERTIFICATE EXAMINATION FOR SCHOOL CANDIDATES, 2024

FINAL MARKING SCHEME

MATHEMATICS 2

QUESTION NO.	SOLUTION						MARKS	
1. (a) (i)		1	2	3	4	5	6	<i>Everything on the</i> B3 ($-\frac{1}{2}ee$) for correct elements
	H	H, 1	H, 2	H, 3	H, 4	H, 5	H, 6	
	T	T, 1	T, 2	T, 3	T, 4	T, 5	T, 6	
	OR							
	$S = \{(H, 1), (H, 2), (H, 3), (H, 4), (H, 5), (H, 6)\}$ $\{(T, 1), (T, 2), (T, 3), (T, 4), (T, 5), (T, 6)\}$						Ignore { } or ()	
	$E = \{(T, 2), (T, 3), (T, 5)\}$						B1 for correct favourable outcomes	
(ii)	$P(E) = \frac{3}{12}$						M1 for probability	
	$P(E) = \frac{1}{4}$						A1 for answer	
(b)	Scale: 1 : 100 $\Rightarrow 1cm \equiv 100cm$ $1cm \equiv 1m$ Area = $l \times w$ $88cm^2 = l \times 8cm$						<i>Converting to the scale</i> M1 for finding length	
	$l = \frac{88cm^2}{8cm}$ $l = 11cm$						A1 for length on the map	
	Actual length of field = 11m Actual width of field = 8m Area of actual field = 8m x 11m						M1 for converting to metres	
	$= 88m^2$						M1 for finding area of actual field A1 for answer	

QUESTION NO.	SOLUTION	MARKS									
	<p><u>ALITER</u></p> <p>Length of field on map = $\frac{88}{8}$ $= 11m$</p> <p>1 : 100 11 : 1100 8 : 800</p> <p>Area of field = 1100×800 $= 880,000cm^2$</p> <p>Area in $m^2 = \frac{880,000}{100 \times 100}$ $= 88m^2$</p>	<p>M1 for division A1 for 11m</p> <p>M1 for product</p> <p>M1 for conversion A1 for answer</p>									
<p>1. (c)</p>	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">10</td> <td style="text-align: center;">3</td> <td style="text-align: center;">8</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">7</td> <td style="text-align: center;">9</td> </tr> <tr> <td style="text-align: center;">6</td> <td style="text-align: center;">11</td> <td style="text-align: center;">4</td> </tr> </table>	10	3	8	5	7	9	6	11	4	<p>M 1 for any row, column or diagonal correct</p> <p>A3 $(-\frac{1}{2} ee)$ for correct entries (-1 ou/wu <u>once</u> only)</p> <p>[15 Marks]</p>
10	3	8									
5	7	9									
6	11	4									

QUESTION NO.	SOLUTION	MARKS
2. (a)	<p>If P = Q</p> <p>Then $\left(\frac{m+3}{2-n}\right) = \left(\frac{3m-1}{n-8}\right)$</p> <p>$m+3 = 3m-1$</p> <p>$2m = 4$</p> <p>$m = \frac{4}{2}$</p> <p>$m = 2$</p> <p>$2-n = n-8$</p> <p>$2n = 10$</p> <p>$n = \frac{10}{2}$</p> <p>$n = 5$</p>	<p>M1 for equating two corresponding components</p> <p>M1 for solving for m</p> <p>A1 for answer</p> <p>M1 for solving for n</p> <p>A1 for answer</p>
(b) (i)	<p>Total parts = $6 + 5 = 11$</p> <p>Let y = Total amount shared</p> <p>Baaba's share = GH¢1,200.00</p> <p>$\frac{6}{11}y = 1,200$</p> <p>$6y = 11 \times 1,200$</p> <p>$y = \frac{11 \times 1,200}{6}$</p> <p>$y = 2,200$</p> <p>Total amount = GH¢2,200.00</p>	<p>B1 for total parts (total ratio)</p> <p>M1 for equation or its equivalent</p> <p>M1 for solving</p> <p>A1 for answer</p> <p>A1</p>

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QUESTION NO.	SOLUTION	MARKS
(b) (ii)	William's share = GH¢2,200.00 – GH¢1,200.00	M1 for subtracting
	= GH¢1,000.00	A1 for GH¢1,000.00 <i>allow for 1000.00</i>
	$I = \frac{prt}{100}$	<i>M1 A1</i>
	= $\frac{1,000 \times 20 \times 2}{100}$	M1 for finding interest
	I = GH¢400.00	A1 for I = GH¢400.00
	Total amount in the account = GH¢1,000 + GH¢400	M1 for finding total amount
= GH¢1,400.00	A1 for answer	
		(-1 ou/wu or 2 d.p. <u>once only</u>) [15 Marks]

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QUESTION NO.	SOLUTION	MARKS
3. (a)	$3\sqrt{50} + 2\sqrt{45} - \sqrt{2} + \sqrt{5}$ $= 3\sqrt{25 \times 2} + 2\sqrt{9 \times 5} - \sqrt{2} + \sqrt{5}$ $= 3 \times \sqrt{25} \times \sqrt{2} + 2 \times \sqrt{9} \times \sqrt{5} - \sqrt{2} + \sqrt{5}$ $= 3 \times 5\sqrt{2} + 2 \times 3\sqrt{5} - \sqrt{2} + \sqrt{5}$ $= 15\sqrt{2} + 6\sqrt{5} - \sqrt{2} + \sqrt{5}$ $= 14\sqrt{2} + 7\sqrt{5}$	<p>M1 for finding needed factors of 50 or 45 <i>Just one of them</i></p> <p>A1 for $5\sqrt{2}$ and $3\sqrt{5}$</p> <p>M1 for simplifying to get $14\sqrt{2}$ or $7\sqrt{5}$</p> <p>A1 for answer</p>
(b)	<p>Let $l = w + 7$</p> $2(w + 7) + 2w = 38$ $2w + 14 + 2w = 38$ $4w = 38 - 14$ $4w = 24$ $w = 6\text{cm}$ <p>Length = $w + 7$</p> $= 6 + 7$ $= 13\text{cm}$ <p>Area = $6\text{cm} \times 13\text{cm}$</p> $= 78\text{cm}^2$	<p>B1 for length = $w + 7$ or its equivalent</p> <p>M1 for equation</p> <p>M1 for solving</p> <p>A1 for $w = 6\text{cm}$</p> <p>M1 for finding length</p> <p>A1 for $l = 13\text{cm}$</p> <p>M1 for finding area</p> <p>A1 for answer</p>
(c)	<p>Let $15\% = 720\text{m}$</p> $\text{Half} = 50\% = \frac{50}{15} \times 720$ $= \frac{5 \times 10 \times 8 \times 9 \times 10}{5 \times 3}$ $= 10 \times 8 \times 3 \times 10$ $= 2,400 \text{ metres}$	<p>M1 for correct ratio $\times 720$</p> <p>M1 for simplifying <i>(any two correct m1) but A1</i></p> <p>A1 for correct answer</p> <p>(-1 ea/wu <u>once</u> only)</p> <p>[15 Marks]</p>

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QUESTION NO.	SOLUTION	MARKS
4.		<p>B1 for $PQ = 5.5 \pm 0.1\text{cm}$ or $QR = 8 \pm 0.1\text{cm}$</p> <p>M1 M1 A1 for $\angle PQR = 90^\circ$</p> <p>M1 for arcs and locating R or P</p> <p>A1 for completing the triangle</p> <p>M1 M1 A1 for perpendicular from Q to line PR</p> <p>B1 for locating M</p>
	<p>(d) (i) $MR = 6.6 \pm 0.1\text{cm}$</p> <p>(ii) $QM = 4.6 \pm 0.1\text{cm}$</p>	<p>B1 for correct value of MR</p> <p>B1 for correct value of QM</p>
(e)	<p>Area of $\Delta QMR = \frac{1}{2} \times MR \times MQ$</p> <p>$= \frac{1}{2} \times 6.6\text{cm} \times 4.6\text{cm}$</p> <p>$= \frac{1}{2} \times 30.36\text{cm}^2$ <i>see writing</i></p> <p>$= 15.18\text{cm}^2$</p> <p>$\cong 15\text{cm}^2$</p>	<p>M1 for finding area <i>(correctly divide by 2)</i></p> <p>M1 for simplifying with evidence</p> <p>A1 for answer <i>(whole number)</i></p> <p>(-1 ou/wu <u>once</u> only)</p> <p>[15 Marks]</p>

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QUESTION NO.	SOLUTION	MARKS
5. (a) (i)	<p>Since the two triangles are similar</p> $\frac{ ST }{ QR } = \frac{ SP }{ PQ }$ $\frac{ ST }{10} = \frac{4}{2+4}$ $ ST = 10 \times \frac{4}{6}$ $ST = \frac{40}{6} = \frac{20}{3} \text{ cm}$ <p>(accept 6.67cm or $6\frac{2}{3}$ cm)</p>	<p>M1 for correct equation or finding the scale factor</p> <p>M1 for solving or using scale factor</p> <p>A1 for answer</p>
(ii)	<p>Let h = height of ΔPQR</p> $h^2 + 5^2 = 6^2$ $h^2 + 25 = 36$ $h^2 = 36 - 25$ $h^2 = 11$ $h = \sqrt{11} \text{ cm}$ <p>Area of $\Delta PQR = \frac{1}{2} \times 10 \text{ cm} \times \sqrt{11} \text{ cm}$</p> $= 5\sqrt{11} \text{ cm}^2$	<p>M1 for using the Pythagoras theorem</p> <p>M1 for solving</p> <p>A1 for correct height</p> <p>M1 for finding area</p> <p>A1 for answer</p>
(b)	<p>Area of Admin and classroom block = $300\frac{1}{4} \text{ m}^2$</p> <p>Area of Library = $200\frac{1}{2} \text{ m}^2$</p> <p>Area of School Park = $120\frac{1}{8} \text{ m}^2$</p> <p>Total Area of Admin/Classroom block, Library and School Park = $300\frac{1}{4} + 200\frac{1}{2} + 120\frac{1}{8}$</p> $= (300 + 200 + 120) + \left(\frac{1}{4} + \frac{1}{2} + \frac{1}{8}\right)$	<p>M1 for finding the total of three areas or converting to improper fraction</p>

	$= 620 + \frac{2 + 4 + 1}{8}$	M1 for sum of whole numbers, common denominator (CD) and one numerator correct
	$= 620 + \frac{7}{8}m^2$	
	$= 620\frac{7}{8}m^2$	A1 for correct area
	Area of Roads and Walkways = $900\frac{1}{2} - 620\frac{7}{8}$	M1 for subtracting
	$= (900 - 620) + \left(\frac{1}{2} - \frac{7}{8}\right)$	
	$= 280 + \left(\frac{4}{8} - \frac{7}{8}\right)$	M1 for 280, CD and one numerator correct
	$= 280 + \left(-\frac{3}{8}\right)$	
	$= 279 + 1 - \frac{3}{8}$	M1 for use of CD to simplify
	$= 279\frac{5}{8}m^2$	A1 for answer (-1 for ou/wu <u>once</u> only)
		[15 Marks]

$$\frac{4}{8} - \frac{7}{8} = -\frac{3}{8}$$

QUE. NO.	SOLUTION	MARKS																
<p>6. (a)</p> <table border="1"> <tr> <td>°C</td> <td>0</td> <td>5</td> <td>10</td> <td>15</td> <td>20</td> <td>25</td> <td>30</td> </tr> <tr> <td>°F</td> <td>32</td> <td>41</td> <td>50</td> <td>59</td> <td>68</td> <td>77</td> <td>86</td> </tr> </table> <p>(b) See attached graph Horizontal and vertical axes Plotting of points Joining of points</p> <p>(c) From the graph, when °F = 55, $^{\circ}\text{C} = 12.75 \pm 0.5$</p> <p>If °C changes by 5 units, °F would change by 9 units. OR If °C changes by 1 unit, °F would change by $\frac{9}{5}$ or 1.8 units. OR If °C changes by 1%, °F would change by 1.8%. OR The rate of change of °F due to a change in °C is $\frac{9}{5}$ or 1.8.</p> <p>(d)</p>	°C	0	5	10	15	20	25	30	°F	32	41	50	59	68	77	86	<p>B4 (-1 ee) for correct entries</p> <p>B1 B1 ($-\frac{1}{2} ee$) B4 ($-\frac{1}{2} ee$) for correct points B1 for joining all points with a straight line</p> <p>M1 for evidence of reading from the graph A1 for answer</p> <p>M1 for use of 5 for $\Delta^{\circ}\text{C}$ or 9 for $\Delta^{\circ}\text{F}$ or finding slope</p> <p>A1 for any <u>one</u> correct interpretation</p> <p>[15 Marks]</p>	
°C	0	5	10	15	20	25	30											
°F	32	41	50	59	68	77	86											



