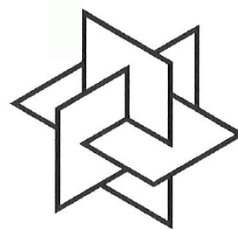

CASE

MATHEMATICS



ISEB
Independent Schools
Examinations Board

Specimen Paper Mark Scheme

Date

Information

The majority of the marks should be awarded for good working/reasoning/explanation.

Marks should be deducted for mathematically incorrect working.

Deduct a maximum of 1 mark per question for incorrect/missing units up to a total of 5 marks.

Credit should be given for good attempts and ideas.

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SECTION A

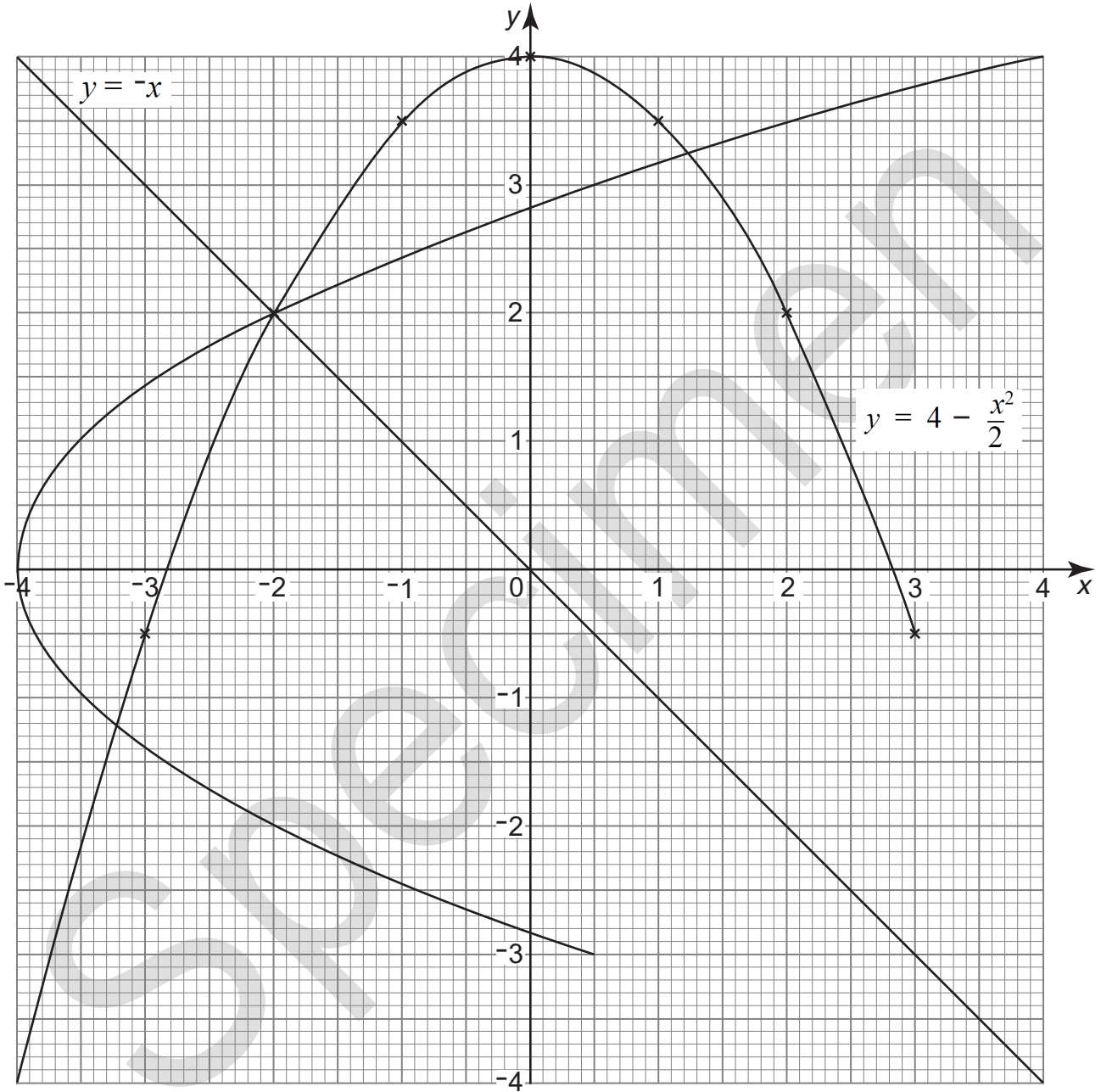
Q.	Answer	Mark	Additional Guidance
1.	i) $0.58\bar{3}$ ii) $5.8\bar{3}\%$	4	
2.	i) $\frac{3}{2} - \frac{1}{3} \div \frac{1}{2}$ $= \frac{9}{6} - \frac{4}{6} = \frac{5}{6}$ ii) $0.1 \times 0.2 \times 0.3 \times 0.5 \times 1200$ $= 0.006 \times 600$ $= 3.6$	4	
3.	i) $6p^2 - 4pr - 4r^2$ ii) $24a^4b^3$ iii) $\frac{8y^4}{9x}$	6	
4.	i) 72 ii) 6 iii) -1.125	6	
5.	i) 140.25 ii) 826 iii) 5610	3	
6.	interior angles = 120° and 108° $360^\circ - 120^\circ - 108^\circ = 132^\circ$ $m = \frac{1}{2}(180^\circ - 132^\circ) = 24^\circ$ $n = 180^\circ - 108^\circ - 24^\circ = 48^\circ$	6	
7. i)	$54 = 2 \times 3 \times 3 \times 3$ $30 = 2 \times 3 \times 5$	6	
ii)	LCM = $9 \times 30 = 270$		
iii)	5		
8.	$t_n = 8n - 3$ $8n - 3 = 613$ $n = 77$	5	
Section A Total		40	

SECTION B

Q.	Answer	Mark	Additional Guidance
1. a) i)	$-1 - 1 - 1 - 1 = -4$	9	
ii)	$48(97 + 48 - 45)$ $48 \times 100 = 4800$		
iii)	$\frac{51(1 + 49)}{20 \times 5.1} = \frac{10 \times 5}{2 \times 1}$ $= 25$		
b)	$\frac{x}{5} = \frac{3}{20}(x + 800)$ $4x = 3x + 2400$ $x = 2400$ new salary = £3200		
2. i)	$10x + 5y = 45$ $10x - 6y = 34$ $11y = 11$ $y = 1 ; x = 4$	6	
ii) a)	$\sqrt{c} = 4$ $\sqrt{d} = 1$ $c = 16$ $d = 1$		
b)	$r = 3x$ $s = -3y$ $r = 12$ $s = -3$		

Q.	Answer	Mark	Additional Guidance
3. i) a) b) ii) a) b) iii)	125 and 216 75 and 108 50 and 108 $\frac{3}{5}$ and $\frac{1}{2}$ $\frac{3}{61}$	8	
4. i) ii)	total distance = $(3 + 18) = 21\text{km}$ total time = 0.3 hour average speed = $21 \div 0.3 = 70 \text{ km/h}$ $t = \text{time in minutes}$ $75 = \left(\frac{90t}{60} + 21\right) \div \frac{(t + 18)}{60}$ $\frac{75(t + 18)}{60} = \frac{3t}{2} + 21$ $\frac{5(t + 18)}{4} = \frac{3t}{2} + 21$ $5t + 90 = 6t + 84$ $t = 6 \quad \text{so time} = 6 \text{ min}$	7	

Q.	Answer	Mark	Additional Guidance																
5. i)	<table border="1"> <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> </tr> <tr> <td>y</td> <td>$-\frac{1}{2}$</td> <td>2</td> <td>$3\frac{1}{2}$</td> <td>4</td> <td>$3\frac{1}{2}$</td> <td>2</td> <td>$-\frac{1}{2}$</td> </tr> </table>	x	-3	-2	-1	0	1	2	3	y	$-\frac{1}{2}$	2	$3\frac{1}{2}$	4	$3\frac{1}{2}$	2	$-\frac{1}{2}$		Expect table of values but not required
x	-3	-2	-1	0	1	2	3												
y	$-\frac{1}{2}$	2	$3\frac{1}{2}$	4	$3\frac{1}{2}$	2	$-\frac{1}{2}$												



	$y = 4 - \frac{x^2}{2}$ curve drawn		
ii)	Reflection drawn	8	
iii)	(4, -4)		

Q.	Answer	Mark	Additional Guidance																																																	
6. i)	<p style="text-align: center;">Claude's score</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="background-color: #cccccc;">></th> <th style="background-color: #cccccc;">1</th> <th style="background-color: #cccccc;">3</th> <th style="background-color: #cccccc;">3</th> <th style="background-color: #cccccc;">3</th> <th style="background-color: #cccccc;">5</th> <th style="background-color: #cccccc;">5</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>6</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> </tbody> </table> <p>Steven's score</p> <p>36 possible outcomes</p> <p>20 wins for Steven</p> <p>probability = $\frac{20}{36} = \frac{5}{9}$</p>	>	1	3	3	3	5	5	2	✓						2	✓						4	✓	✓	✓	✓			4	✓	✓	✓	✓			4	✓	✓	✓	✓			6	✓	✓	✓	✓	✓	✓	6	Table not required
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ii)	<p>Steven's: 2, 2, 4, 4, 4, 4 or</p> <p>Claude's: 3, 3, 3, 3, 5, 5</p>																																																			

Q.	Answer	Mark	Additional Guidance
7. i)	$y = 6 - 3 - 1$ $= 2$	8	
ii)	area of logo = 50 cm^2 $2 + 2 + 2x = 10$ $x = 3$		
iii)	$\sqrt{3^2 + 2^2} = \sqrt{13}$ $5 + 1 + 2 + 3 = 11$ perimeter = $(22 + 2\sqrt{13}) \text{ cm}$		
iv)	scale factor = $\sqrt{9} = 3$ new perimeter = $(66 + 6\sqrt{13}) \text{ cm}$		
8. i)	a) $7 + 11 - 7 \times 11$ $= -59$ b) $3 + 4 - 12$ $= -5$ $-5 @ 5$ $= 0 - -25$ $= 25$	6	
ii)	$a @ a$ $= 2a - a^2$ $a \odot (2a - a^2)$ $= a + 2a - a^2 - a(2a - a^2)$ $= 3a - a^2 - 2a^2 + a^3$ $= 3a - 3a^2 + a^3$		
Section B Total		60	
Paper Total		100	