

## Summer 2008 IGCSE Maths Mark Scheme - Paper 4H

Q	Working	Answer	Mark	Notes
1. (a)	$6x - 2x = 7 - 13$ or $2x - 6x = 13 - 7$ $4x = -6$ or $-4x = 6$	$x = -1 \frac{1}{2}$ oe	3	M1 $6x - 2x + 13 - 7 = 0$ or $2x - 6x - 13 + 7 = 0$ M1 A1 Accept $-6/4$ or $-3/2$ (not $6/-4$ or $3/-2$ )
(b)	$y - 2 \times 5 = 4 \times 5$ or $y/5 = 4 + 2$	$y = 30$	2	M1 A1
				Total 5 marks

2. (a)		$250 \pm 2$	2	B2 B2 for angle 248 to 252 inclusive. B1 for angle 190 to 260 inclusive
(b)		$305 \pm 3$	2	B2 Award B1 for a bearing $270^\circ < \text{angle} < 360^\circ$
				Total 4 marks

3. (a)	$20/2$ or $(20 + 1)/2$	6	2	M1 A1
(b)		Yes, no or not nec'y with consistent reason	2	B2 Can't tell B1
				Total 4 marks

4	(a)	$3 - 5x - 2$	13	2	M1 A1
	(b)		$5y - 10$	1	B1
	(c)		$w(w + 5)$	2	B2 B1 for two factors that multiply to give at least one correct term. SC $w(w + 5)$ B1
					Total 5 marks

5.	(a)	$30 \times 0.2$	6	2	M1 A1 or $30 \div 5$
	(b)	$0.2 + 0.1$	0.3 oe	2	M1 A1
					Total 4 marks

6.		8/12 or 3/12	$\frac{8}{12}, \frac{3}{12}$	2	M1 A1 Accept $(4 \times 2)/(4 \times 3)$ or $(3 \times 1)/(4 \times 3)$ SC Multiply bs by 12 B1 Decimal methods M0 A0
					Total 2 marks

7.	(a)		$3^{14}$	1	B1	
	(b)		$7^3$	1	B1	
	(c)	$5^n = \frac{5^2 \times 5^7}{5^3}$ or $n + 3 - 7 = 2$	$n = 6$	2	M1 A1	Accept $5^{n+3} = 5^9$
	(d)	Product of positive integer powers of both 2 and 3 only	24 or $2^3 \times 3$	2	M1 A1	Powers and/or products may be evaluated.
						Total 6 marks

8.	$\frac{1}{2} \times 3 \times 4$ $3 \times 15$ and $4 \times 15$ and $5 \times 15$		192	4	M1 M2 A1	M1 for any ONE of these. cao
						Total 4 marks

9.	$8x = 12$ or $8y = -4$		$x = 1.5$ oe $y = -0.5$ oe	3	M1 A1 A1	Eliminate one variable correctly. Accept $3x + 5x - 8 = 4$ or $5(4 - y)/3 - y = 8$ oe No working M0 A0 A0
						Total 3 marks

10.	(a)		4.8	1	B1
	(b)	$5^2 - "4.8"{}^2$ or 1.96 $\sqrt{(5^2 - "4.8"{}^2)}$	1.4	3	M1 M1dep A1  cao
					Total 4 marks

11.			123.47 & 123.53	2	B2 B1 for 123.37 & 123.43 (equal to 1dp) or 123.57 & 123.63
					Total 2 marks

12.	(a)		63	1	B1 cao
	(b)	$4 \times 5/8$ oe	2.5	2	M1 A1 or $8 \div 2 = 4$ so $5 \div 2 = \dots$ , or $4 \div 1.6$
		or $\sqrt{(6^2 + 5^2 - 2 \times 6 \times 5 \cos 20^\circ)}$ or $(5 \times \sin 20^\circ) / \sin 63^\circ$	2.15 1.92		M1 for complete trig method. A1 for answer to 3SF.
	(c)	$6 \times 8/5$ oe	9.6	2	M1 A1
		or $\sqrt{(4^2 + 8^2 - 2 \times 4 \times 8 \cos '97^\circ')}$ or $(8 \times \sin '97^\circ') / \sin 63^\circ$ or $(4 \times \sin '97^\circ') / \sin 20^\circ$	9.37 8.91 11.6		M1 for complete trig method. A1 for answer to 3SF.
					Total 5 marks

13.	(a)		$\frac{2}{3}$ correctly placed once Correct structure All correct	3	B1 B1 B1	correct 4 new lines, ignore labels/probs including labels/probs
	(b)	$\frac{2}{3}x^{\frac{2}{3}}$ $1 - \frac{2}{3}x^{\frac{2}{3}}$ or $\frac{1}{3} + \frac{2}{3}x^{\frac{1}{3}}$ or $\frac{1}{3}x^{\frac{2}{3}} + \frac{2}{3}x^{\frac{1}{3}} + \frac{1}{3}x^{\frac{1}{3}}$	$\frac{5}{9}$ oe	3	M1 M1 A1	$\frac{1}{3}x^{\frac{2}{3}}$ or $\frac{2}{3}x^{\frac{1}{3}}$ or $\frac{1}{3}x^{\frac{1}{3}}$
<b>Total 6 marks</b>						

14.	(a)(i)	vert diff/horiz diff for any 2 points on L			M1	
			0.5 oe	2	A1	
	(a)(ii)	$y = "0.5"x + \text{constant}$	$Y = "0.5"x + 1$ oe	2	M1f A1f	SC "0.5"x + 1 or L = "0.5"x + 1 B1
	(b)		$x \leq 4$ $y \geq -1$ $Y \leq 0.5x + 1$ oe	3	B1 B1 B1	Allow < SC All inequalities wrong way round B1 Allow > Allow <
<b>Total 7 marks</b>						

15.		$3.1^2 + 3.9^2 - 2 \times 3.1 \times 3.9 \times \cos 80^\circ$ $9.6 + 15.2 - 4.2$	4.54	3	M1 M1 A1	$3.1^2 + 3.9^2 - 24.2 \times \cos 80^\circ$ or 20.6
<b>Total 3 marks</b>						

16.	(a)	$\frac{5 \pm \sqrt{((-5)^2 - 4 \times 3)}}{2}$ $\frac{5 \pm \sqrt{13}}{2}$			M1	
			4.30 and 0.697	3	A1	allow 4.3 and 0.697
	(b)	$y < 3$ or $y > -3$	$-3 < y < 3$	2	M1 A1	Allow $y \leq 3$ or $y \geq -3$
						Total 5 marks

17.	(a)	Try to find area of 2-4 block. Try to find total area.			M1	or 8 M0 for 2/8 or 9 - 1 With consistent scale.
			40%	3	M1 A1	
	(b)	Half total area or try to find middle of distribution			M1f	ft dep on M1 for total area in (a)
			4	2	A1	Cao
						Total 5 marks

18.		$x \times 4 = 3 \times 14$ oe	$x = 10.5$ oe	2	M1 A1	$\frac{x}{14} = \frac{3}{4}, \frac{3}{(3+4)} = \frac{x}{(x+14)}, \frac{4}{(3+4)} = \frac{14}{(x+14)}$
						Total 2 marks

19.	(a)		$2t - 6$	2	B1B1
	(b)	$2 \times 5 - 6$	4	2	M1f A1 Sub $t = 5$ in "ds/dt" dep on linear f(t) M0 for $(2 \times 5 - 6)/5$ Cao
	(c)	$d("2t - 6")/dt$	2	2	M1 A1 Attempt diff "ds/dt" dep on linear f(t) Cao
					<b>Total 6 marks</b>

20.	(a)	$14 \times 10^{12}$ oe	$1.4 \times 10^{13}$	2	M1 A1 or 1.4e13
	(b)(i)		16	1	B1 cao
	(b)(ii)	$(p + q) \times 10^{15} = r \times 10^n$	$(p + q)/10$ oe	2	M1 A1 may be seen in (i) $0.1(p + q), (p + q) \times 10^{-1},$ $\frac{p \times 10^{15} + q \times 10^{15}}{10^{16}}$
					<b>Total 5 marks</b>

21.	(a)(i)		$a + b$ oe	1	B1
	(a)(ii)		$-a$ oe	1	B1
	(a)(iii)		$b - a$ oe	1	B1
	(b)		5	1	B1
					<b>Total 4 marks</b>

22.	$\frac{1}{2} \times 6 \times 8 \times \sin x^\circ = 12$ $\sin x^\circ = 0.5$ 30	$x = 150$	4	M1 M1 A1 A1	allow $x = 30$
					Total 4 marks

23. (a)	$(x - 3)(x + 3)$ $x(x + 3)$	$\frac{x - 3}{x}$	3	M1 M1 A1	$1 - \frac{3}{x}$
(b)	$\frac{1}{x^2} - 3$ $\frac{1}{x^2}$ or $1 - \frac{3}{x^2}$	$1 - 3x^2$	2	M1 A1	ft $\frac{x + 3}{x}$ only  cao
					Total 5 marks