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 M1 A1	$6x - 2x + 13 - 7 = 0$ or $2x - 6x - 13 + 7 = 0$ 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±2	2	B2	B2 for angle 248 to 252 inclusive. B1 for angle 190 to 260 inclusive
	(b)		305±3	2	B2	Award B1 for a bearing 270^o < angle < 360^o
						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 – 5 x -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** $w(w + 5w)$ B1
						Total 5 marks

5.	(a)	30 x 0.2	6	2	M1 A1	or 30 ÷ 5
	(b)	0.2 + 0.1	0.3 oe	2	M1 A1	
						Total 4 marks

6.	8/12 **or** 3/12	$^{8}/_{12}$, $^{3}/_{12}$	2	M1 A1	Accept (4x2)/(4x3) **or** (3x1)/(4x3) **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.	½ x 3 x 4 3 x 15 and 4 x 15 and 5 x 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 x 5/8 oe	 2.5	 2	M1 A1	or 8 ÷ 2 = 4 so 5 ÷ 2 = …, or 4 ÷ 1.6
		or ✓($6^2 + 5^2 - 2$ x 6 x 5 cos 20°) *or* (5 x sin 20°) / sin 63°	2.15 1.92			M1 for complete trig method. A1 for answer to 3SF.
	(c)	6 x 8/5 oe	 9.6	 2	M1 A1	
		or ✓($4^2 + 8^2$ - 2 x 4 x 8 cos '97°') *or* (8 x sin '97°')/sin 63° *or* (4 x sin '97°')/sin 20°	9.37 8.91 11.6			M1 for complete trig method. A1 for answer to 3SF.
						Total 5 marks

13. (a)		$^2/_3$ correctly placed once Correct structure All correct	3	B1 B1 B1	correct 4 new lines, ignore labels/probs including labels/probs
(b)	$^2/_3 \times {}^2/_3$ $1-{}^2/_3 \times {}^2/_3$ or $^1/_3+{}^2/_3 \times {}^1/_3$ or $^1/_3 \times {}^2/_3 + {}^2/_3 \times {}^1/_3 + {}^1/_3 \times {}^1/_3$	$^5/_9$ oe	3	M1 M1 A1	$^1/_3 \times {}^2/_3$ or $^2/_3 \times {}^1/_3$ or $^1/_3 \times {}^1/_3$
					Total 6 marks

14. (a)(i)	vert diff/horiz diff for any 2 points on L	0.5 oe	2	M1 A1	
(a)(ii)	y = "0.5"x + 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 < Allow > Allow < SC **All** inequalities wrong way round B1
					Total 7 marks

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
					Total 3 marks

16.	(a)	$\frac{5 \pm \sqrt{((-5)^2 - 4x3)}}{2}$ $\frac{5 \pm \sqrt{13}}{2}$	4.30 and 0.697	3	M1 M1 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.	40%	3	M1 M1 A1	or 8 M0 for 2/8 or 9 - 1 With consistent scale.
	(b)	Half total area or try to find middle of distribution	4	2	M1f A1	ft dep on M1 for total area in (a) Cao
						Total 5 marks

18.		x x 4 = 3 x 14 oe	x = 10.5 oe	2	M1 A1	$^{x}/_{14} = {}^{3}/_{4}$, $^{3}/_{(3+4)} = {}^{x}/_{(x+14)}$, $^{4}/_{(3+4)} = {}^{14}/_{(x+14)}$
						Total 2 marks

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

20.	(a)	14×10^{12} oe	1.4×10^{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) $0.1(p + q)$, $(p + q) \times 10^{-1}$, $\frac{p \times 10^{15} + q \times 10^{15}}{10^{16}}$
						Total 5 marks

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	
						Total 4 marks

22.	$^1/_2 \times 6 \times 8 \times \sin x^o = 12$ $\sin x^o = 0.5$ 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)	$\frac{\frac{1}{x^2}-3}{\frac{1}{x^2}}$ or $1-\frac{3}{\frac{1}{x^2}}$	$1 - 3x^2$	2	M1 A1	ft $\frac{x+3}{x}$ only cao
					Total 5 marks