November 2009 IGCSE Mathematics (4400) Mark Scheme – Paper 3H

Q	Working	Answer	Mark	Notes
1.	"x"/15 + "y"/15 or ((2x5)+(1x3))/(3x5)		2	B1 denominators common multiple of 15 or 10/15 or 3/15 (accept (2x5)/15 or (3x1)/15) B1 correct answer equivalent to 13/15
				Total 2 marks

2.	8y -5y = 3 +9 3y = 12 or 3y-12=0	4oe	3	M1 correct gathering of terms M1 (can imply Ist M1) A1 Answer only or embedded answer =M0A0
				Total 3 marks

3.	(a)	360 ÷ 8 (=45) (180 – "45") / 2	180 x 6/8 (=135) "135"÷2	67.5	3	M1 M1 dep A1
	(b)	360 ÷ 30	180-30=180(n-2)/n	12	2	M1 A1
						Total 5 marks

4.	(1x3)+ (2x2)+(3x7)+(4x13)+(5x11) "135"÷ 36	3.75	3	M1 must see at least 3 correct products M1 (dep) A1 accept 4 with working
				Total 3 marks

5.	(a)	12*x* + 6(*x* + 2) oe		18*x* +12	2	B2 B1 for 12*x* or 6(*x* + 2) penalise errors
	(b)	"a" = 57 18*x* + 12 =57 or 45 ÷ 18		2.5	2	M1ft "a"= linear term b *x* + c (c, b ≠ 0) A1 cao allow numerical methods
						Total 4 marks

Q		Working	Answer	Mark	Notes
6.	(a)		6	1	B1
	(b)		1 , 2	1	B1
	(c)		Black cats	1	B1 Cats that are black etc
					Total 3 marks

7.	(a)	2 x π x30	188	2	M1 A1 188(.495...) awrt 188 or 189
	(b)	4.2^2 ((=17.6(4)) π x 2.1^2 (= 13.8.....) "4.2^2" - "π x 2.1^2"	3.79	4	M1 M1 M1 dep on both previous M1 marks A1 Accept awrt 3.78 or 3.79
					Total 6 marks

8.	0.1 + 0.05 + 0.05 or 1 – (0.4 + 0.3 + 0.1)	0.2	2	M1 A1
				Total 2 marks

9.	(a)	2w - 6 +3w +15	5w +9	2	M1 M1 for 3 correct terms (no isw) A1
	(b)	x +5 = 3 x 9	22	2	M1 A1 Answer only or embedded answer =M0A0
	(c)	5y < 13 – 7	y<6/5oe	2	M1 Must be an inequality A1
					Total 6 marks

10.	2 x (0.5 x 8 x 15) +(17 x 20) +(15 x 20) +(8 x 20) 2 x 60 +340 + 300 + 160	920	3	M1 1 correct face 60, 340, 300 or 160 M1 All correct faces added 120 Ŧ 2x60 A1
				Total 3 marks

Q	Working	Answer	Mark	Notes
11.	$P^2 = ab$ or $p/\sqrt{b} = \sqrt{a}$	P^2/b oe	2	M1 accept $P^2 = a \times b$ and $p \times p = a \times b$ A1
				Total 2 marks

12.	(a)	$4^2 + 6^2$ (=52) $\sqrt{"52"}$		7.21	3	M1 M1 (dep) A1 7.21(11...) awrt 7.21
	(b)	Alt. y/sin 90 = 5/sin 70 M1 y = 5 / sin70 M1	cos 20 = 5/y y = 5/ cos 20	5.32	3	M1 cos selected M1 A1 5.32088..... awrt 5.32
						Total 6 marks

13.	(a)		Algeria	1	B1 Accept 2.4×10^6
	(b)		10	1	B1 Ten times etc
	(c)		4.348×10^6 or 4.35×10^6	2	B2 B1 for digits 4348 or 4350000 or 4.3×10^6
					Total 4 marks

14.	2 lines where coeff of x or y are "equal"	x=1, y=-1/3	3	M1 eg 4x – 6y =6 or 6x - 9y = 9 and 3x + 6y =1 and 6x + 12y = 2 and then add/subtract (condone 1 num. error) or make x or y the subject in either equation & subst. A1 A1 Answers alone =M0A0
				Total 3 marks

15.	2125 ÷ 0.85 oe	2500	3	M2 M1 for 2125 ÷ 85 (=25) or 85%=2125 or 0.85 x "x" = 2125 A1 cao
				Total 3 marks

Q	Working	Answer	Mark	Notes
16. (a)	Read height at cf 100 or 100.5	54 to 56 inc	2	M1 A1
(b)	200 – (178 to 182)	18 to 22 inc	2	M1 A1
				Total 4 marks

17. (a)	$(x - y)(x + y)$		1	B1	
(b)	$c^2 + 2cd + d^2 - d^2$	$c(c + 2d)$	2	M1 A1	Alt $(c + d + d)(c + d - d)$
(c)		$(2w + 3)(w - 1)$	2	B2	B1 for 1 correct factor or $(2w-3)(w+1)$ Integers only
					Total 5 marks

18.	Alt. 144 π M1 112π/144π(=7/9) or 32π/144π(=2/9) M1 7/9 x 360 or 2/9 x 360 =80 M1	$x/360 \times \pi \times 12^2 = 112\pi$ $(x=)112 \pi \times 360/12^2 \pi$ oe	280	4	M2 M1 for $x/360 \times \pi \times 12^2$ ($=0.4\pi x$ or 1.256...x) M1 A1
					Total 4 marks

19. (a)	$x^2/x(x-2)$	$x/(x-2)$	2	M1 A1	M1 for $x(x-2)$ brackets not necessary
(b)	$\frac{2(x+1) - (2x - 1)}{(2x - 1)(x +1)}$ $\frac{2x+2 - 2x + 1}{(2x - 1)(x +1)}$	$\frac{3}{(2x - 1)(x +1)}$ oe	4	M2 M1 A1	M1 for $(2x - 1)(x + 1)$ seen $\frac{3}{2x^2 + x - 1}$
					Total 6 marks

Q	Working	Answer	Mark	Notes
20. (a)	$(2/3)^3$	8/27 oe	2	M1 A1 0.296.....
(b)	$(2/3)^2$ x 1/3 x 3	4/9 oe	3	M2 M1 for $(2/3)^2$ x 1/3 (=4/27) A1 0.444....
				Total 5 marks

21. (a)	t = k √d 12 = k √4 k = 6	t =6√d	3	M1 M1 A1 Must make t the subject
(b)	"6" x √9	18	2	M1ft A1 ft
				Total 5 marks

22.	210 – 70 (=140) ("AB"^{2}=) $3^2 + 5^2$ – 2 x 3 x 5 cos "x" ("AB"^{2}=) 56.98	7.55	3	M1 x=80,140,210 A1 awrt 57 A1 7.5485.... awrt 7.54 or 7.55
				Total 3 marks

23.	d/s = t 25 x 400.5 / 4.95 (=2022.727...)secs "2022.727"/60 (=33.712..) mins	33mins 43 secs	4	M2 M1 for 400.5 or 4.95 seen M1 dep on at least 1 previous M1 A1 cao
				Total 4 marks

Q	Working	Answer	Mark	Notes
24. (a) (i)		$x^2 - 3$	1	B1 accept "y=" $x^2 - 3$
(ii)		$x + 3$	1	B1 accept "y=" $x + 3$
(b)	"$x^2 - 3$" = "$x + 3$" $x^2 - x - 6 = 0$ $(x - 3)(x + 2)$ (=0)	$x = 3$ $x = -2$	3	M1ft quadratic = linear (ax+b) a,b≠ 0 M1 or formula reaching (x=) $(1 \pm \sqrt{25})/2$ A1 cao algebraic method req^d
				Total 5 marks

25. (a)	$a^{3.5} = k\, a^{0.5}$ or $a^3\sqrt{a}(=k\sqrt{a})$	n=3	2	M1 M1 for 3.5 and 0.5 seen or $(\sqrt{a})^6$ or a^3 A1
(b)	$2^{-1} \times 2^{-0.5}$	$2^{-1.5}$	2	M1 $1/2^{1.5}$ or $\sqrt{2}/4$ or $2^{0.5}/2^2$ or $2^{0.5} \times 2^{-2}$ A1
				Total 4 marks

				TOTAL FOR PAPER: 100 MARKS