IGCSE MATHEMATICS 4400, NOVEMBER 2005 MARK SCHEME

Paper 4H

Q		Working	Answer	Mark		Notes
1	(a)		11, 12, 13, 15	**2**	B2	one omission B1 one extra prime or mult of 3: B1
	(b)		**Ø or** empty set **or** nothing oe	**1**	B1	not "0" or "A intersection B"
	(c)		No; 11 isn't a multiple of 3	**1**	B1	
						Total 4 marks

2	(a)	250 / 5 x 3	150	**3**	M1 M1 A1	either order
	(b)	200 / 5 x 8	320	**3**	M1 M1 A1	either order or each x 40, add
						Total 6 marks

3	(a)		$x(x - 5)$	**1**	B1	
	(b)		$2x^2 + 3xy$	**2**	B1B1	
	(c)	$x^2 - 4x + 2x - 8$	$x^2 - 2x - 8$	**2**	M1 A1	3 correct terms **or** 4 correct terms ignoring signs
						Total 5 marks

4	(a)		24 ± 1, 84 ± 1	**2**	B1B1	22 & 82: SC B1
	(b)		home oe	**1**	B1	not “at destination”
	(c)		0 to 40	**1**	B1	**or** range within this
	(d)	5/20 **or** 5 x 3	14.4 to 15	**2**	M1 A1	(4.4 to 6) / 20 or other correct
	(e)		84 ± 2	**1**	B1	ft(a)
						Total 7 marks

5	(a)		220 ± 2	**2**	B2	B1 for 180<angle<270
	(b)	four construction arcs seen	line, length >4cm	**2**	B1 B1	± 2 mm of correct
	(c)		300	**1**	B1	
						Total 5 marks

6	(a)		rotation 90° (clockwise) about (2, 0)	**3**	B1 B1 B1	 or 270° anticlockwise any extra transf: B0
	(b)		FTTF	**2**	B2	B1 for three correct
						Total 5 marks

7	(a)	1 – (0.25 + 0.25 + 0.1)	0.4	**2**	M1 A1	(1 – 0.51 =) 0.49 : allow M1
	(b)	0.25 + 0.1	0.35	**2**	M1 A1	(0.25 + 0.1 =) 0.26 : allow M1
						Total 4 marks

8		mid-points attempted Σfx attempted (190) $\div \Sigma f$ (20)	9.5	**4**	B1 M1 M1 A1	Consistent x in range dep M1
						Total 4 marks

9		$\cos 68 = 4.8/x$ **or** $4.8 = x\cos 68$ $x = 4.8 / \cos 68$	12.8...	**3**	M1 M1 A1	
						Total 3 marks

10	(a)		Nigeria	**1**	B1	
	(b)		1.08×10^8	**2**	B2	figs 108 : B1
	(c)		4.2×10^7	**1**	B1	
						Total 4 marks

11	(a)		$x^2 + (x + 2)^2 = (x + 3)^2$	**1**	B1	oe brackets essential; ISW
	(b)	correctly expand one bracket all terms seen & correct collection		**2**	B1 B1	allow seen in (a)
	(c)	$x = (2 + \sqrt{((-2)^2 - 4 \times (-5))}/ 2$ oe $x = 3.4$ (or better)	 3.4, 5.4, 6.4	**3**	M1 A1 B1f	 ignore other ans, if given ft her 3.4
						Total 6 marks

12	(a)	(i) vertical ÷ horizontal (ii)	 2 hourly charge oe	**2** **1**	M1 A1 B1	
	(b)		$y = 2x + 1$	**2**	B1B1	B1f: (his 2)x ; B1: +1; -B1 if no 'y ='
	(c)	line through (0,3) grad = 1.5 **or** $1 + 2x = 3 + 1.5x$	4	**2**	M1 A1	
						Total 7 marks

13	(a)		1/3 & 1/2 oe correct structure all correct	**3**	B1 B1 B1	correctly placed once just branches including probabilities and labels
	(b)	$(1/6)^2$ **or** $(1/3)^2$ **or** $(1/2)^2$ oe add these	 7/18 **or** 0.38(8...) **or** 0.39 oe	**3**	M1 M1 A1	
	(c)	$(5/6)^2$	 25/36 **or** 0.69(4...) oe	**2**	M1 A1	
						Total 8 marks

14		max/min attempted 1005 / 2.45	 411	**3**	M1 M1 A1	 410 : sc B2
						Total 3 marks

15	(a)		$3x^2 - 12$	**2**	B2	B1 each term; -B1 for extra
	(b)	$3 \times 0^2 - 12$	 -12	**2**	M1 A1	
	(c)	(his $3x^2 - 12$) = 0 $(x - 2)(x + 2) = 0$ **or** $(3x - 6)(x + 2) = 0$ oe $x = 2$ or -2 or (2,1)	 A is (-2, 33), C is (2, 1)	**4**	M1 M1 A1 A1	 or $x^2 = 4$
						Total 8 marks

16		20 **or** $(x + 10)$ seen $9 \times 20 = 10 (x + 10)$	 $x = 8$	**3**	M1 M1 A1	 or $9 \times 20 / 10$ oe
						Total 3 marks

17	(a)		$-1 \le f(x) \le 1$	**2**	B1B1	**or** –1 to 1 oe
	(b)	range of g : 0 to 1	 $p = 0, q = 45$	**3**	B3	both correct : B3 g : 0 to 1 & one end correct : B2 g : 0 to 1 <u>or</u> one end correct : B1
						Total 5 marks

18	(a)		$3\sqrt{2}$	**1**	B1	
	(b)	$\frac{1}{16\sqrt{2}}$ **or** $\frac{\sqrt{2}}{\sqrt{2}} x \frac{1}{\left(\sqrt{2}\right)^9}$ $\frac{\sqrt{2}}{\sqrt{2}} x \frac{1}{16\sqrt{2}}$ **or** $\frac{\sqrt{2}}{\left(\sqrt{2}\right)^{10}}$	$\frac{\sqrt{2}}{32}$ or $\frac{\sqrt{512}}{512}$	**3**	M1 M1 A1	or $\left(\frac{\sqrt{2}}{2}\right)^9$ or $\frac{1}{\sqrt{512}}$ or $\frac{16\sqrt{2}}{512}$ or $\frac{1}{\sqrt{512}} \times \frac{\sqrt{512}}{\sqrt{512}}$
						Total 4 marks

19		sees that 1 square = 12 stones 12 x total no. of squares (29)	348	**3**	M1 M1 A1	or correct scale shown or correctly uses his scales to find total area
						Total 3 marks

20			(7, -1)	**2**	B2	B1 each coordinate
						Total 2 marks

21		$5^2 + 5^2$ **or** $10^2 + 10^2$ $\sqrt{50}$ **or** ½ $\sqrt{200}$ **or** 7.07 (...) tan VAM = 12 / (her 7.07) oe	59.49(...) **or** 59.5	**4**	M1 M1 M1 A1	 dep 1st M1
						Total 4 marks **PAPER TOTAL 100 MARKS**