

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)		\emptyset 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)	$250 / 5 \times 3$	150	3	M1 M1 A1	either order
	(b)	$200 / 5 \times 8$	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

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4	(a)		$24 \pm 1, 84 \pm 1$	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 $180 < \text{angle} < 270$
	(b)	four construction arcs seen	line, length $> 4\text{cm}$	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	2	M1 A1		
		(ii)	hourly charge oe	1	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 $0.38(8\dots)$ or 0.39 oe	3	M1 M1 A1	
	(c)	$(5/6)^2$	$25/36$ or $0.69(4\dots)$ 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)		$-1 \leq f(x) \leq 1$	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 $\frac{\sqrt{2}}{\sqrt{2}} \times \frac{1}{(\sqrt{2})^9}$ $\frac{\sqrt{2}}{\sqrt{2}} \times \frac{1}{16\sqrt{2}}$ or $\frac{\sqrt{2}}{(\sqrt{2})^{10}}$	$\frac{\sqrt{2}}{32}$ 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 $\frac{1}{2} \sqrt{200}$ or 7.07 (...) tan VAM = 12 / (her 7.07) oe	59.49(...) or 59.5	4	M1 M1 M1 A1	dep 1 st M1
						Total 4 marks
						PAPER TOTAL 100 MARKS