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Mark Scheme (Results)
November 2008

IGCSE

IGCSE Mathematics (4400) Paper 4H

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November 2008 IGCSE 4400 Maths Mark Scheme – Paper 4H

Q		Working	Answer	Mark	Notes
1.	(i)		$3a + b$	**1**	B1 oe
	(ii)		$2a + 3b$	**2**	B2 B1 each term or if unsimplified: $3a+2b - a + b$ or $3a+2b - (a - b)$: B2 $3a+2b - a - b$: B1 not ISW
					Total 3 marks

2	(a)	24 ÷ 4 x 3 oe	18	**2**	M1 M1 for 24÷4 or 24×3 or 3÷4 A1
	(b)	40 ÷ 8 x 5 oe	25	**2**	M1 M1 8 (3+5 or used in 40/8) A1
					Total 4 marks

3.	(a)	0.5 x 1.5 x 1.2 triangle + 2 x 1.5	3.9	**3**	M1 or 0.9 M1 2×1.5 + ….. or 3.2×1.5 - …… A1
	(b)	"3.9" / 20 or "3.9" ×0.05 x 1000	195	**3**	M1 or 1000 ÷ 20 M1dep x "3.9" 50 x"3.9" or 1000÷(20/"3.9") M2 SC: 100÷(20/"3.9") M1 A1f
					Total 6 marks

Q	Working	Answer	Mark	Notes
4.	165 ÷ 60 =2.75	 2 h 45 m	 **3**	M1 1 km/min A1 165 mins A1
				Total 3 marks

5.	(a)	1 – (0.2 + 0.1)	0.7	**2**	M1 A1 oe
	(b)	0.2 x 20	4	**2**	M1 or $^{4}/_{20}$ oe A1 or 4 out of 20
					Total 4 marks

6.	(a)		$5x - 10$	**2**	B2 B1 for 5x or 5×*x*; B1 for - 10 or + -10 ignore "*x* = 2" but subseq incorrect wking: - B1
	(b)	$^{x}/_{4} = 10 - 3$ or $x + 4\times3 = 4\times10$	28	**2**	M1 oe A1
	(c)	$5x > 8$	$x > 1.6$	**2**	M1 condone "=" only if ans "*x* > 1.6" A1 "*x* > 1.6" but just "> 1.6" on line: M1A1 "*x*>1.6" but "1.6" or "*x*=1.6"on line: M1A0 allow ≥
					Total 6 marks

Q	Working	Answer	Mark	Notes
7.	$4^2 + 6^2$ (= 52) $\sqrt{}$"52" or $2\sqrt{}13$	 7.21…	 **3**	M1 $\sin(\tan^{-1}(4/6)) = 4/h$ M1 dep $h = 4/\sin(\tan^{-1}(4/6))$ A1
				Total 3 marks

8.	A: travelling at a steady speed B: not moving C: speed is increasing		**3**	B1 B1 B1
				Total 3 marks

9 (a)(i)		3, 6, 9	**1**	B1	
(ii)		2, 3, 4, 6, 8, 9, 10	**2**	B2	Any order One omission or extra: B1
	In (b)(i) & (ii), answers must refer to context, not just sets				
(b)(i)	(Students who study) maths and history in 12Y		**2**	B1 B1	or "study both" allow maths + history indep
(ii)	(They) don't study maths		**1**	B1	or No students in *R* study maths No students who study maths are in R Not: They don't study maths or history
					Total 6 marks

Q	Working	Answer	Mark	Notes
10.	Product of $\geq$ 3 factors, of which 2 are from {2, 2, 3, 11}. Can be implied by factor tree or repeated division 2, 2, 3, 11	 $2 \times 2 \times 3 \times 11$	 **3**	M1 M1 A1 or $2^2 \times 3 \times 11$
				Total 3 marks

11.	(a)		P(T) = $^1/_3$ correct structure all probs & labels correct	**3**	B1 B1 B1
	(b)	$^2/_3 \times {}^2/_3$	$^4/_9$ oe	**2**	M1 A1 0.44
	(c)	$(^2/_3)^2$ or (b) or $^2/_3 x {}^1/_3$ $^2/_3 x {}^1/_3 x 2 + (^2/_3)^2$ or +(b)	$^8/_9$ oe	**3**	M1 M1 $1 - (^1/_3)^2$ M2 A1 0.89, allow 0.88
					Total 8 marks

Q	Working	Answer	Mark	Notes
12. (a)(i)		11	**1**	B1
(ii)		ab	**1**	B1
(b)		$1.44 \times 10^{p+q+1}$	**2**	B2 B1 each for 1.44 and $p + q + 1$
				Total 4 marks

13. (a)	$\frac{-2 \pm \sqrt{(2^2 - 4 \times (-1))}}{2}$ $\frac{-2 \pm \sqrt{8}}{2}$ or better	$x = -2.41$ or 0.414	**3**	M1 A1 A1	allow … 4×-1 or $-1 \pm \sqrt{2}$
(b)	$2 = 3(y + 4)$ or $y + 4 = {}^{2}/_{3}$	$y = -3{}^{1}/_{3}$	**2**	M1 A1	oe
					Total 5 marks

14. (a)	${}^{6}/_{h} = \cos 32$ oe $h = {}^{6}/_{\cos 32}$	7.08	**3**	M1 M1 A1	$(6\tan 32)^2 + 6^2$ or $3.75^2 + 6^2$ (= 50.056…) √"50.056.." allow 7.07 to 7.08
(b)	½ x 3 x 7 x sin115	9.52	**3**	M2 A1	or ½ x 3 x 7 x sin(top angle) M1
					Total 6 marks

Q	Working	Answer	Mark	Notes
15.	$2x - 4y = 4$ or $x = 2y + 2$ or similar	$x = 1$ $y = -{}^{1}/_{2}$ oe	**3**	M1 correctly equate coeffs of x or y or make x or y the subject A1 A1
				Total 3 marks

16.	(1 sq reps) $120 \div 6$ (=20) or 6 squs reps 120 $(0.5\times6+2+2) \times$ "20" or "20" × 7	140	**3**	M1 (f.d. per g) = $^{1}/_{3}\times120\div20$ or $^{1}/_{6}\times120 \div10$ (= 2) or 2, (4, 6, 8) on fd axis M1dep $5\times$"2"$\times6 + 10 \times 2\times$"2" + 20 x"2" $120 \times {}^{7}/_{6}$: M2 A1
				Total 3 marks

17.	(a)		$(2x + 3)(x + 1)$	**2**	B2 B1 if expansion wd give 2 correct terms
	(b)		$(2y + 3)(2y - 3)$	**2**	B2 B1 if expansion wd give 2 correct terms
					Total 4 marks

18.	(a)		81	**1**	B1
	(b)	$25 = 5^2$ or $5 = 25^{0.5}$ or 0.5x20 oe	25^{10}	**2**	M1 not 5 × 5 A1
	(c)	2^3 or $8^{1/3}$ or $8^{0.5}$ or $(\sqrt{2})^3$ or $\sqrt{(2^3)}$ or $2^{1/2}\times2^{1/2}\times2^{1/2}$ or 3×0.5	$2^{1.5}$ oe	**2**	M1 must involve power(s) not $2\sqrt{2}$ not $\sqrt{2}\times\sqrt{2}\times\sqrt{2}$ A1
					Total 5 marks

Q	Working	Answer	Mark	Notes
19. (a)(i)		**x** + 2**y** oe	**1**	B1
(ii)		**x** + **y** oe	**1**	B1 eg –**y** + **x** + 2**y** ISW
(b)	*AE* = *DC* *AE* // *DC*	$\overrightarrow{EC}$ = 2**y** – **y** = **y** or $\overrightarrow{EC}$ = **y** shown on diag so $\overrightarrow{EC}$ = $\overrightarrow{AD}$ *EC* & *AD eq* & //	**2**	B1 B1 dep (ii) correct if no mks otherwise scored, $\overrightarrow{AE}$ = $\overrightarrow{DC}$ B1
				Total 4 marks

20. (a)(i)		$6x - 1$	**2**	B2	B1 for $6x$ or $6x^1$ B1 for -1
(ii)		$-x^{-2}$ or $-1x^{-2}$ or $-1/x^2$	**2**	B2	B1 for x^{-2} oe -B1 for incorrect re-writing eg $-1/x^{-2}$
(b)	$3x^2$ "$3x^2$" = 12	(-2, -8) (2, 8)	**3**	B1 M1 A1	
					Total 7 marks

21. (a)		$1/5$ oe	**1**	B1	
(b)		-3	**1**	B1	or $x \neq -3$ or f(-3) or $x = -3$
(c)		7	**1**	B1	
(d)	$1/(x+3) + 2$	$(2x + 7)/(x + 3)$	**2**	M1 A1	
					Total 5 marks

Q	Working	Answer	Mark	Notes	
22. (a)(i)		sin x	**1**	B1	not sin$x$ = $^{BM}/_{1}$ not x = sin^{-1}*BM*
(ii)		2sin x	**1**	B1	
(b)	2 – 2cos2x		**1**	B1	oe eg $1^2 + 1^2 - 2 \times 1 \times 1 \times \cos 2x$ not ISW
(c)	$(2\sin x)^2 = 2 - 2\cos(2x)$ oe $2(\sin x)^2 = 1 - \cos(2x)$	$(\cos(2x) = 1 - 2(\sin x)^2)$	**2**	M1 A1	or $2\cos(2x) = 2 - 4(\sin x)^2$ not ISW
					Total 5 marks