

Mark Scheme (Results) November 2008

IGCSE

IGCSE Mathematics (4400) Paper 4H

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)	$24 \div 4 \times 3$ oe	2	M1 M1 for $24 \div 4$ or 24×3 or $3 \div 4$ A1
	(b)	$40 \div 8 \times 5$ oe	2	M1 M1 8 (3+5 or used in $40/8$) A1
				Total 4 marks

3.	(a)	$0.5 \times 1.5 \times 1.2$ triangle + 2×1.5	3	M1 or 0.9 M1 $2 \times 1.5 + \dots$ or $3.2 \times 1.5 - \dots$ A1
	(b)	$"3.9" / 20$ or $"3.9" \times 0.05$ $\times 1000$	3	M1 or $1000 \div 20$ M1dep $\times "3.9"$ $50 \times "3.9"$ or $1000 \div (20 / "3.9")$ M2 SC: $100 \div (20 / "3.9")$ M1
				Total 6 marks

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

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

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

Q	Working	Answer	Mark	Notes
7.	$4^2 + 6^2 (= 52)$ √"52" or 2/13	7.21...	3	M1 M1 dep A1 $\sin(\tan^{-1}(4/6)) = 4/h$ $h = 4 / \sin(\tan^{-1}(4/6))$
				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
	(b)(i)	In (b)(i) & (ii), answers must refer to context, not just sets (Students who study) maths and history in 12Y	2	B1 or "study both" allow maths + history B1 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 ≥ 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)		$P(T) = \frac{1}{3}$ correct structure all probs & labels correct	3	B1 B1 B1
(b)	$\frac{2}{3} \times \frac{2}{3}$	$\frac{4}{9}$ oe	2	M1 A1 0.44
(c)	$(\frac{2}{3})^2$ or (b) or $\frac{2}{3} \times \frac{1}{3}$ $\frac{2}{3} \times \frac{1}{3} \times 2 + (\frac{2}{3})^2$ or +(b)	$\frac{8}{9}$ oe	3	M1 M1 $1 - (\frac{1}{3})^2$ 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)	$\frac{-2 \pm \sqrt{(2^2 - 4x(-1))}}{2}$ $\frac{-2 \pm \sqrt{8}}{2}$ or better			M1 allow ... $4x-1$ A1 or $-1 \pm \sqrt{2}$ A1
(b)	$2 = 3(y + 4)$ or $y + 4 = \frac{2}{3}$	$x = -2.41$ or 0.414 $y = -3\frac{1}{3}$	3 2	A1 M1 A1 oe
				Total 5 marks

14. (a)	$\frac{6}{h} = \cos 32$ oe $h = \frac{6}{\cos 32}$	7.08	3	M1 $(6 \tan 32)^2 + 6^2$ or $3.75^2 + 6^2 (= 50.056\dots)$ M1 $\sqrt{50.056\dots}$ A1 allow 7.07 to 7.08
(b)	$\frac{1}{2} \times 3 \times 7 \times \sin 115$	9.52	3	M2 or $\frac{1}{2} \times 3 \times 7 \times \sin(\text{top angle})$ M1 A1
				Total 6 marks

Q	Working	Answer	Mark	Notes
15.	$2x - 4y = 4$ or $x = 2y + 2$ or similar	$x = 1$ $y = -\frac{1}{2}$ 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 sqs reps 120 ($0.5 \times 6 + 2 + 2$) \times "20" or "20" $\times 7$	140	3	M1 (f.d. per g) = $\frac{1}{3} \times 120 \div 20$ or $\frac{1}{6} \times 120 \div 10$ (= 2) or 2, (4, 6, 8) on fd axis M1dep $5 \times "2" \times 6 + 10 \times 2 \times "2" + 20 \times "2"$ $120 \times \frac{7}{6}$: 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 0.5×20 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 $2^{1/2} \times 2^{1/2} \times 2^{1/2}$ 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)	$x + 2y$ oe	1	B1
	(ii)	$x + y$ oe	1	B1 eg $-y + x + 2y$ ISW
	(b)	$\overline{EC} = 2y - y = y$ or $\overline{EC} = y$ shown on diag so $\overline{EC} = \overline{AD}$ $AE = DC$ $AE \parallel DC$ $EC \& AD$ eq & \parallel	2	B1 B1 if no mks otherwise scored, $\overline{AE} = \overline{DC}$ B1
			Total 4 marks	

20.	(a)(i)	$6x - 1$	2	B2
	(ii)	$-x^{-2}$ or $-1x^{-2}$ or $-1/x^2$	2	B2 B1 for $6x$ or $6x^1$ B1 for -1 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	not $\sin x = \frac{BM}{1}$ not $x = \sin^{-1} BM$
(ii)		$2\sin x$	1	
(b)	$2 - 2\cos 2x$		1	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