Location Entry Codes

As part of CIE's continual commitment to maintaining best practice in assessment, CIE has begun to use different variants of some question papers for our most popular assessments with extremely large and widespread candidature, The question papers are closely related and the relationships between them have been thoroughly established using our assessment expertise. All versions of the paper give assessment of equal standard.

The content assessed by the examination papers and the type of questions are unchanged.

This change means that for this component there are now two variant Question Papers, Mark Schemes and Principal Examiner's Reports where previously there was only one. For any individual country, it is intended that only one variant is used. This document contains both variants which will give all Centres access to even more past examination material than is usually the case.

The diagram shows the relationship between the Question Papers, Mark Schemes and Principal Examiner's Reports.

Question Paper	**Mark Scheme**	**Principal Examiner's Report**
Introduction	Introduction	Introduction
First variant Question Paper	First variant Mark Scheme	First variant Principal Examiner's Report
Second variant Question Paper	Second variant Mark Scheme	Second variant Principal Examiner's Report

Who can I contact for further information on these changes?
Please direct any questions about this to CIE's Customer Services team at: international@cie.org.uk

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2008 question paper

0580 and 0581 MATHEMATICS

0580/21 and 0581/21   Paper 21 (Extended), maximum raw mark 70

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the October/November 2008 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.
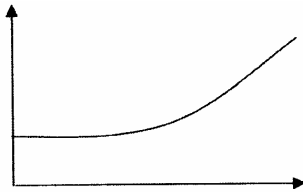
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Page 2	Mark Scheme	Syllabus	Paper
	IGCSE – October/November 2008	0580/0581	21

Abbreviations

cao	correct answer only
ft	follow through after an error
oe	or equivalent
SC	Special Case
www	without wrong working

1	(a) 2	1	
	(b) 0	1	Allow none oe
2	$a = 3$ $b = 4$	 2	**W1** one correct If no marks scored **M1** $(3 \times 2)(2 \times 4)$ oe
3	1.59(459…) or 59/37 or $1\frac{22}{37}$	2	**M1** $\frac{22}{37}$ or 0.5945… seen
4	(a) 2.67×10^{-2}	1	cao – must be correct notation
	(b) 0.0267(00…)	1ft	correct or ft
5	Correct locus	2	**M1** arc through D radius BD **A1** some indication that the arc is from D to D'
6	60 120	 2	**W1** one correct Allow 60.00.. or 120.00.. or if **W0**, **SC1** the angles add up to 180°
7	50.1225 cao	2	**M1** 6.15 and 8.15 seen
8	$x^2(a + b)$ $(\pm) \sqrt{((p^2 + d^2)/(a + b))}$	1 2	 **M1** 2 moves **completed** correctly
9	(a) $y = 2x – 4$	2	**W1** $2x + c$ **or** **W1** $mx – 4$
	(b) (2, 0)	1ft	For $y = 2x + k$ only, allow $(–k/2, 0)$
10	$x = 8$ $y = 5$	3	**M1** ×2 and add or ×3 and subtract **A1**
11	$\dfrac{-18}{(2x+3)(x-3)}$ oe	3	**W1** denominator correct in answer space (including any brackets) **M1** $4(x – 3) –2(2x + 3)$ **A1** –18
12	$x > –0.16$ or $–0.16 < x$ or $x > -\dfrac{4}{25}$	3	**M1** 2 moves **completed** correctly **M1** 2 more moves **completed** correctly Final mark must be given for answer line
13	1.25	3	**M1** $p = k/(q + 2)^2$ or $p(q + 2)^2 = k$ **A1** $k = 125$ ⎪ **M1** $p = (k/(q + 2))^2$ **A1** $k^2 = 125$ or $k = \sqrt{125}$
			If no marks awarded **SC1** 5 : $k/25$ in this form p : $k/100$ (colon optional) or **SC1** for either $5 = k/(3 + 2)^2$ or $5 = k/5^2$ Allow 5/4
14	(a) 45498 or 4.5498×10^4 cao	2	**M1** $2.656 \times 10^9 \div 58376$
	(b) 7240	2	**M1** $\dfrac{(a)}{2\pi} = (r)$

Page 3	Mark Scheme	Syllabus	Paper
	IGCSE – October/November 2008	0580/0581	21

15	(a)	0.5 or $\frac{1}{2}$	1	
	(b)	–1 or –1.(00) cao www	2	**M1** cos180
	(c)	$\frac{\cos x - 4}{2}$ oe	2	**M1** subtracting 4 and then dividing by 2 seen e.g. $\frac{x-4}{2}$ or $\frac{y-4}{2}$ or $\frac{f(x)-4}{2}$
16	(a)	1000 1400 1960 2744 3842 (2740) (3840)	2	**W1** three correct 3 sf answers or better
	(b)		2	**P1**ft 4 or 5 plots correct or ft from their table **C1** smooth curve cao To half a small square If a curve and a line are drawn mark the curve
	(c)	3.2 or 3.3	1ft	cao or ft from their **(b)**
17	(a)	(i) $-3\mathbf{p} - 2\mathbf{q}$	1	allow $-(3\mathbf{p} + 2\mathbf{q})$
		(ii) $-3\mathbf{p} + 4\mathbf{q}$	1	allow $-(3\mathbf{p} - 4\mathbf{q})$
		(iii) $-4\mathbf{p}$	2	**M1 (ii)** $- (\mathbf{p} + 4\mathbf{q})$ or $BC - AC = BA$ or **(ii)** $- \mathbf{p} - 4\mathbf{q}$
	(b)	8	1	
18	(a)	1.05	2	**M1** clear attempt at y–step/x–step
	(b)	3360	3	**M1** attempting the area under the graph **W1** $\frac{(140+180) \times 21}{2}$ May be done by triangles and rectangles
	(c)	18.7	1ft	**(b)** / 180 evaluated correctly
19	(a)	53.4	3	**M1** $50/360 \times \pi \times 12^2$ or $30/360 \times \pi \times 6^2$ **M1** $50/360 \times \pi \times 12^2 - 30/360 \times \pi \times 6^2$
	(b)	49.6	3	**M1** $50/360 \times 2 \times \pi \times 12$ or $30/360 \times 2 \times \pi \times 6$ **M1** $12 + 6 + 12 + 6 +$ both their arcs
20	(a)	$600x + 1200y \geq 720000$	1	seen
	(b)	$x + y \leq 900$	1	
	(c)		4	**W1** drawing $x + y = 900$ **W1** drawing $x + 2y = 1200$ **W1** R is below $x + y = 900$ **W1** R is above $x + 2y = 1200$ The lines must be in the right place Accurate to one small square
	(d)	300	1ft	Correct or ft from their labelled R, accuracy ± 10 on the lowest y value in R
			70	

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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2008 question paper

0580 and 0581 MATHEMATICS

0580/22 and 0581/22   Paper 22 (Extended), maximum raw mark 70

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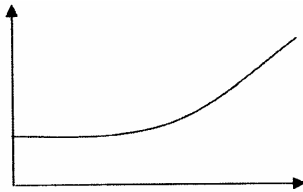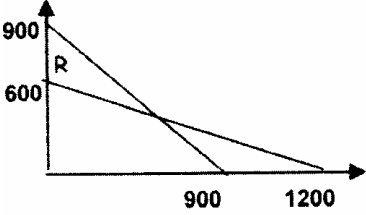
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International Examinations

Page 2	Mark Scheme	Syllabus	Paper
	IGCSE – October/November 2008	0580/0581	22

Abbreviations

cao	correct answer only
ft	follow through after an error
oe	or equivalent
SC	Special Case
www	without wrong working

1	**(a)** 2	1	
	(b) 0	1	Allow none oe
2	$a = 4$ $b = 3$	2	**W1** one correct If no marks scored **M1** $(4 \times 2)(2 \times 3)$ oe
3	1.59(459…) or 59/37 or $1\frac{22}{37}$	2	**M1** $\frac{22}{37}$ or 0.5945… seen
4	**(a)** 3.85×10^{-2}	1	cao – must be correct notation
	(b) 0.0385(00…)	1ft	correct or ft
5	Correct locus	2	**M1** arc through D radius BD **A1** some indication that the arc is from D to D'
6	45 135	2	**W1** one correct Allow 45.. or 135.00.. or if **W0**, **SC1** the angles add up to 180°
7	15.8025 cao	2	**M1** 2.45 and 6.45 seen
8	$x^2(a + b)$ $(\pm) \sqrt{((p^2 + d^2)/(a + b))}$	1 2	**M1** 2 moves **completed** correctly
9	**(a)** $y = 2x - 6$	2	**W1** $2x + c$ **or** **W1** $mx - 6$
	(b) (3, 0)	1ft	For $y = 2x + k$ only, allow $(-k/2, 0)$
10	$x = 5$ $y = 2$	3	**M1** ×4, ×3 and add or ×3 and subtract **A1**
11	$\dfrac{-17}{(5x + 1)(2x - 3)}$ oe	3	**W1** denominator correct in answer space (including any brackets) **M1** $5(2x - 3) - 2(5x + 1)$ **A1** -17
12	$x > -0.16$ or $-0.16 < x$ or $x > -\dfrac{4}{25}$	3	**M1** 2 moves **completed** correctly **M1** 2 more moves **completed** correctly Final mark must be given for answer line
13	$0.64 \; \dfrac{16}{25}$	3	**M1** $p = k/(q + 2)^2$ or $p(q + 2)^2 = k$ **M1** $p = (k/(q + 2))^2$ **A1** $k^2 = 64$ or $k = 8$ **A1** $k = 64$ If no marks awarded **SC1** 4 : $k/16$ in this form $p : k/100$ (colon optional) or **SC1** for either $4 = k/(2 + 2)^2$ or $4 = k/4^2$
14	**(a)** 45498 or 4.5498×10^4 cao	2	**M1** $2.656 \times 10^9 \div 58376$
	(b) 7240	2	**M1** $\dfrac{\textbf{(a)}}{2\pi} = (r)$

Page 3	Mark Scheme	Syllabus	Paper
	IGCSE – October/November 2008	0580/0581	22

15	(a)	1	1	
	(b)	0	2	**M1** tan180
	(c)	$\dfrac{\tan x - 6}{2}$ oe	2	**M1** subtracting 6 and then dividing by 2 seen e.g. $\dfrac{x-6}{2}$ or $\dfrac{y-6}{2}$ or $\dfrac{f(x)-6}{2}$
16	(a)	1000 1400 1960 2744 3842 (2740) (3840)	2	**W1** three correct 3 sf answers or better
	(b)		2	**P1**ft 4 or 5 plots correct or ft from their table **C1** smooth curve cao To half a small square
	(c)	3.2 or 3.3	1ft	If a curve and a line are drawn mark the curve cao or ft from their **(b)**
17	(a)	**(i)** $-3\mathbf{p} - \mathbf{q}$	1	allow $-(3\mathbf{p} + \mathbf{q})$
		(ii) $-4\mathbf{p} + 2\mathbf{q}$	1	allow $-(4\mathbf{p} - 2\mathbf{q})$ or $-2(2\mathbf{p} - \mathbf{q})$ or $2(\mathbf{q} - 2\mathbf{p})$
		(iii) $-5\mathbf{p}$	2	**M1 (ii)** $-(\mathbf{p} + 2\mathbf{q})$ or $BC - AC = BA$ or **(ii)** $- \mathbf{p} - 2\mathbf{q}$
	(b)	10	1	
18	(a)	1.05	2	**M1** clear attempt at y–step/x–step
	(b)	3360	3	**M1** attempting the area under the graph **W1** $\dfrac{(140+180)\times 21}{2}$ May be done by triangles and rectangles
	(c)	18.7	1ft	**(b)** / 180 evaluated correctly
19	(a)	37.1	3	**M1** $50/360 \times \pi \times 10^2$ or $30/360 \times \pi \times 5^2$ **M1** $50/360 \times \pi \times 10^2 - 30/360 \times \pi \times 5^2$
	(b)	41.3	3	**M1** $50/360 \times 2 \times \pi \times 10$ or $30/360 \times 2 \times \pi \times 5$ **M1** $10 + 5 + 10 + 5 +$ both their arcs
20	(a)	$600x + 1200y \geq 720000$	1	seen
	(b)	$x + y \leq 900$	1	
	(c)		4	**W1** drawing $x + y = 900$ **W1** drawing $x + 2y = 1200$ **W1** R is below $x + y = 900$ **W1** R is above $x + 2y = 1200$ The lines must be in the right place Accurate to one small square
	(d)	300	1ft	Correct or ft from their labelled R, accuracy ± 10 on the lowest y value in R
			70	