

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.

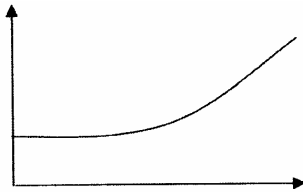
| Page 2 | Mark Scheme | Syllabus | Paper |
|--------|-------------------------------|-----------|-------|
| | IGCSE – October/November 2008 | 0580/0581 | 21 |

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 | $a = 3$ | 2 | W1 one correct |
| | $b = 4$ | | 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 | 2 | W1 one correct Allow 60.00.. or 120.00.. |
| | 120 | | or if W0 , SC1 the angles add up to 180° |
| 7 | 50.1225 cao | 2 | M1 6.15 and 8.15 seen |
| 8 | $x^2(a + b)$ | 1 | |
| | $(\pm)\sqrt{(p^2 + d^2)/(a + b)}$ | 2 | M1 2 moves completed correctly |
| 9 | (a) $y = 2x - 4$ | 2 | W1 $2x + c$ <u>or</u> W1 $mx - 4$ |
| | (b) (2, 0) | 1ft | For $y = 2x + k$ only, allow $(-k/2, 0)$ |
| 10 | $x = 8$ $y = 5$ | 3 | M1 $\times 2$ and add or $\times 3$ and subtract A1 |
| 11 | $\frac{-18}{(2x + 3)(x - 3)}$ 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 $-0.16 < x$ | 3 | M1 2 moves completed correctly |
| | or $x > -\frac{4}{25}$ | | 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 $\frac{(a)}{2\pi} = (r)$ |

| 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 | P1ft 4 or 5 plots correct or ft from their table C1 smooth curve cao To half a small square |
| |  | 1ft | If a curve and a line are drawn mark the curve cao or ft from their (b) |
| 17 | (a) (i) $-3p - 2q$ | 1 | allow $-(3p + 2q)$ |
| | (ii) $-3p + 4q$ | 1 | allow $-(3p - 4q)$ |
| | (iii) $-4p$ | 2 | M1 (ii) $-(p + 4q)$ or $BC - AC = BA$ or (ii) $-p - 4q$ |
| (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 | |

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

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.

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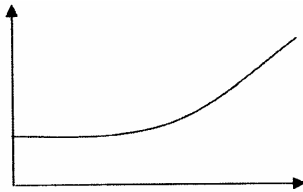
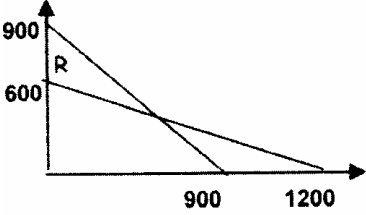
| Page 2 | Mark Scheme | Syllabus | Paper |
|--------|-------------------------------|-----------|-------|
| | IGCSE – October/November 2008 | 0580/0581 | 22 |

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 | $a = 4$ | 2 | W1 one correct |
| | $b = 3$ | | 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 | 2 | W1 one correct Allow 45.. or 135.00.. |
| | 135 | | or if W0 , SC1 the angles add up to 180° |
| 7 | 15.8025 cao | 2 | M1 2.45 and 6.45 seen |
| 8 | $x^2(a + b)$ | 1 | |
| | $(\pm)\sqrt{(p^2 + d^2)/(a + b)}$ | 2 | M1 2 moves completed correctly |
| 9 | (a) $y = 2x - 6$ | 2 | W1 $2x + c$ <u>or</u> W1 $mx - 6$ |
| | (b) (3, 0) | 1ft | For $y = 2x + k$ only, allow $(-k/2, 0)$ |
| 10 | $x = 5$ $y = 2$ | 3 | M1 $\times 4$, $\times 3$ and add or $\times 3$ and subtract A1 |
| 11 | $\frac{-17}{(5x + 1)(2x - 3)}$ 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 $-0.16 < x$ | 3 | M1 2 moves completed correctly |
| | or $x > -\frac{4}{25}$ | | M1 2 more moves completed correctly Final mark must be given for answer line |
| 13 | $0.64 \frac{16}{25}$ | 3 | M1 $p = k/(q + 2)^2$ or $p(q + 2)^2 = k$ A1 $k = 64$ |
| | | | M1 $p = (k/(q + 2))^2$ A1 $k^2 = 64$ or $k = 8$ |
| | | | 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 $\frac{(a)}{2\pi} = (r)$ |

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

| | | | |
|----|---|--------------------|--|
| 15 | (a) 1 (b) 0 (c) $\frac{\tan x - 6}{2}$ oe | 1 2 2 | M1 tan180 M1 subtracting 6 and then dividing by 2 seen e.g. $\frac{x-6}{2}$ or $\frac{y-6}{2}$ or $\frac{f(x)-6}{2}$ |
| 16 | (a) 1000 1400 1960 2744 3842 (2740) (3840) (b)  (c) 3.2 or 3.3 | 2 2 1ft | W1 three correct 3 sf answers or better P1ft 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 cao or ft from their (b) |
| 17 | (a) (i) $-3p - q$ (ii) $-4p + 2q$ (iii) $-5p$ (b) 10 | 1 1 2 1 | allow $-(3p + q)$ allow $-(4p - 2q)$ or $-2(2p - q)$ or $2(q - 2p)$ M1 (ii) $-(p + 2q)$ or $BC - AC = BA$ or (ii) $-p - 2q$ |
| 18 | (a) 1.05 (b) 3360 (c) 18.7 | 2 3 1ft | M1 clear attempt at y -step/ x -step M1 attempting the area under the graph W1 $\frac{(140 + 180) \times 21}{2}$ May be done by triangles and rectangles (b) / 180 evaluated correctly |
| 19 | (a) 37.1 (b) 41.3 | 3 3 | M1 $50/360 \times \pi \times 10^2$ or $30/360 \times \pi \times 5^2$ M1 $50/360 \times \pi \times 10^2 - 30/360 \times \pi \times 5^2$ ----- 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) $600x + 1200y \geq 720000$ (b) $x + y \leq 900$ (c)  (d) 300 | 1 1 4 1ft | seen 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 Correct or ft from their labelled R, accuracy ± 10 on the lowest y value in R |
| | | 70 | |