

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 May/June 2008 question paper

0580/0581 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.

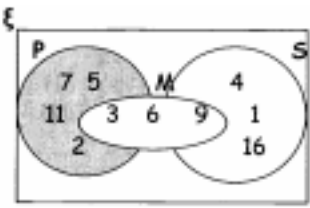
Mark schemes must be read in conjunction with the question papers and the report on the examination.

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

CIE is publishing the mark schemes for the May/June 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 – May/June 2008 | 0580/0581 | 21 |

| | | | |
|----|--|---------|--|
| 1 | 53 and 59 | 1, 1 | independent of each other |
| 2 | $\frac{11x}{18}$ | 2 | M1 $\frac{6x}{18} + \frac{10x}{18} - \frac{5x}{18}$ oe fractions with common denom. not decimals |
| 3 | 150 | 2 | M1 $\frac{18}{12} \times 100$ |
| 4 | (a) 2870 (b) $(n + 3)^2 + 1$ | 1 1 | cao Allow $n^2 + 6n + 10$, $(n + 2 + 1)^2 + 1$, $(n - 1 + 4)^2 + 1$ oe |
| 5 | \$231.13 cao | 2 | M1 245 / 1.06 or $245 \times 0.94(3\dots)$ Allow 231, 231.1, 231.13... for M1 |
| 6 | $\frac{598}{601} \frac{399}{401} \frac{698}{701}$ | 2 | M1 correct decimals seen 0.99501.... 0.9957(2....) 0.99500... First and third must be to at least 5sf Accept these decimals in answer space |
| 7 | (a) 1045.28 cao (b) <u>1000</u> | 1 1 | Allow 1.0×10^3 |
| 8 | $9x^2$ | 2 | B1 9 B1 x^2 terms must be multiplied |
| 9 | $y = \frac{1}{2}x + 5$ | 3 | M1 ($m=$) $\frac{8-5}{6-0}$ oe B1 ($c=$) 5 or M1 A1 $y - 8 = \frac{1}{2}(x - 6)$ or $y - 5 = \frac{1}{2}(x - 0)$ Allow 3/6 for the $\frac{1}{2}$ A1 $y = \frac{1}{2}x + 5$ or $2y - x = 10$ oe |
| 10 | $r = 18$ $h = 42$ cao www | 3 | M1 Length scale factor of 6 used or stated A1 A1 |
| 11 | (\pm) 7.94 | 3 | M1 $21^2 = (2x)^2 + x^2 - 2.2x.x.\cos 120$ oe M1 $441 = 7x^2$ |
| 12 | (a)  (b) 4 | 2 1√ | B1 P and S not intersecting. Two sets must be labelled Three intersecting circles will have $P \cap S$ empty. from the number of elements in the shaded area |
| 13 | $x < -23\frac{1}{2}$ or -23.5 | 3 | M1 2 moves completed correctly M1 2 more moves completed correctly |

| Page 3 | Mark Scheme | Syllabus | Paper |
|--------|-----------------------|-----------|-------|
| | IGCSE – May/June 2008 | 0580/0581 | 21 |

| | | | |
|----|--|-------------------------------|--|
| 14 | | <p>1 1 1</p> | <p>Line in correct place; bisects rectangle Line 2cm long in correct place $\frac{1}{4}$ circles in correct place Not freehand.</p> |
| 15 | $\begin{pmatrix} -11 \\ -11 \\ -14 \end{pmatrix}$ | <p>1 1 1</p> | |
| 16 | (1, 3) www | 3 | <p>M1 consistent multiplication and subtraction/addition A1 A1 Allow $x = 1$ and $y = 3$ (1, k) or (k, 3) scores 2 marks ONLY if M1 is scored</p> |
| 17 | 20 | 4 | <p>B1 $\frac{370 + x}{500 + x} = \frac{3}{4}$ oe fraction, decimal, percentage M1 two moves completed correctly M1 two more correct moves completed</p> |
| 18 | <p>(a) -14</p> <p>(b) $2x^3 - 6x^2 + 12x - 9$</p> <p>(c) $\frac{x + 1}{2}$</p> | <p>1 2 2</p> | <p>M1 attempting to double $f(x)$ and -1 M1 valid method</p> |
| 19 | <p>(a) (i) Triangle (-1, -2)(-1, -3)(-3, -2)</p> <p>(ii) Reflection in $y = -x$</p> <p>(b) $\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$</p> | <p>2 2 2</p> | <p>M1 for one correct vertex of the triangle drawn on the diagram M1 for the word reflection A1 $y = -x$ oe Combined transformation must be fully correct to the final answer but -1 once for the detail (e.g. centre, angle, etc) B1 each column or M1 solving two pairs of sim. equations A1 all correct in answer space</p> |
| 20 | <p>(a) 12900</p> <p>(b) 23300</p> <p>(c) (i) 2.33×10^{13}</p> <p>(ii) 1.55×10^{13}</p> | <p>3 1√ 1√ 2√</p> | <p>M1 $(160^2 \text{ or } 100^2) \times \pi \times 95/360$ M1 subtracting the two areas above (a) multiplied by 1.8 (b) $\times 10^9$ M1 (c)(i) / 1.5</p> |

| Page 4 | Mark Scheme | Syllabus | Paper |
|--------|-----------------------|-----------|-------|
| | IGCSE – May/June 2008 | 0580/0581 | 21 |

| | | | |
|----|----------|---|---|
| 21 | (a) 11.3 | 5 | <p>B1 identifying angle FAC</p> <p>M1 $600^2 + 800^2$ A1 1000 (for AC)</p> <p>M1 $\tan x = 200/\text{their } 1000$</p> <p>(or $\cos x = "1000"/"1020"$)</p> <p>Alternative method via DF and AF</p> <p>M1 $"(200^2 + 600^2)" + 800^2$ A1 1020</p> <p>M1 $\sin x / (\sin 90) = 200/"1020"$ oe</p> <p>cosine rule also possible</p> |
| | (b) 233 | 3 | <p>M1 $\tan y = 800/600$ oe $\sin y, \cos y$</p> <p>M1 an angle found in (b) + 180 written in working</p> |

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MARK SCHEME for the May/June 2008 question paper

0580/0581 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.

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.

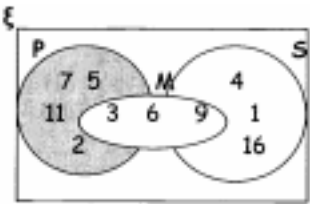
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| Page 2 | Mark Scheme | Syllabus | Paper |
|--------|-----------------------|-----------|-------|
| | IGCSE – May/June 2008 | 0580/0581 | 22 |

| | | | |
|----|--|---------|--|
| 1 | 59 and 61 | 1, 1 | independent of each other |
| 2 | $\frac{13x}{18}$ | 2 | M1 $\frac{6x}{18} + \frac{14x}{18} - \frac{7x}{18}$ oe fractions with common denom. not decimals |
| 3 | 140 | 2 | M1 $\frac{21}{15} \times 100$ |
| 4 | (a) 1240 (b) $(n + 4)^2 + 1$ | 1 1 | cao Allow $n^2 + 16n + 17$, $(n + 3 + 1)^2 + 1$, $(n - 1 + 5)^2 + 1$ oe |
| 5 | \$308.41 cao | 2 | M1 $330 / 1.07$ or $330 \times 0.93(4579\dots)$ Allow M1 308, 308.4(1...) |
| 6 | $\frac{598}{601} \frac{399}{401} \frac{698}{701}$ | 2 | M1 correct decimals seen 0.99501.... 0.9957(2....) 0.99500... First and third must be to at least 5sf Accept these decimals in answer space |
| 7 | (a) 2045.49 cao (b) <u>2000</u> | 1 1 | Allow 2.0×10^3 |
| 8 | $8x^3$ | 2 | B1 8 B1 x^3 terms must be multiplied |
| 9 | $y = \frac{1}{2}x + 7$ | 3 | M1 ($m=$) $\frac{10-7}{6-0}$ oe B1 ($c=$) 7 or M1 A1 $y - 10 = \frac{1}{2}(x - 6)$ or $y - 7 = \frac{1}{2}(x - 0)$ Allow $3/6$ for the $\frac{1}{2}$ A1 $y = \frac{1}{2}x + 7$ or $2y - x = 14$ oe |
| 10 | $r = 24$ $h = 36$ cao www | 3 | M1 Length scale factor of 6 used or stated A1 A1 |
| 11 | (\pm) 7.21 | 3 | M1 $26^2 = (3x)^2 + x^2 - 2.3x.x.\cos 120$ oe M1 $676 = 13x^2$ |
| 12 | (a)  (b) 4 | 2 1√ | B1 P and S not intersecting. Two sets must be labelled Three intersecting circles will have $P \cap S$ empty. from the number of elements in the shaded area |
| 13 | $x < -23\frac{1}{2}$ or -23.5 | 3 | M1 2 moves completed correctly M1 2 more moves completed correctly |

| Page 3 | Mark Scheme | Syllabus | Paper |
|--------|-----------------------|-----------|-------|
| | IGCSE – May/June 2008 | 0580/0581 | 22 |

| | | | |
|----|--|-------------------------------|--|
| 14 | | <p>1 1 1</p> | <p>Line A in correct place; bisects rectangle Line 2cm long in correct place $\frac{1}{4}$ circles in correct place Not freehand.</p> |
| 15 | $\begin{pmatrix} -11 \\ -11 \\ -14 \end{pmatrix}$ | <p>1 1 1</p> | |
| 16 | (1, 3) www | 3 | <p>M1 consistent multiplication and subtraction/addition A1 A1 Allow $x = 1$ and $y = 3$ (1, k) or (k, 3) scores 2 marks ONLY if M1 is scored</p> |
| 17 | 20 | 4 | <p>B1 $\frac{370 + x}{500 + x} = \frac{3}{4}$ oe fraction, decimal, percentage M1 two moves completed correctly M1 two more correct moves completed</p> |
| 18 | <p>(a) -17</p> <p>(b) $2x^3 - 6x^2 + 12x - 17$</p> <p>(c) $\frac{x + 3}{2}$</p> | <p>1 2 2</p> | <p>M1 attempting to double $f(x)$ and -3 M1 valid method</p> |
| 19 | <p>(a) Triangle (-1, -2)(-1, -3)(-3, -2) Reflection in $y = -x$</p> <p>(b) $\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$</p> | <p>2 2 2</p> | <p>M1 for one correct vertex of the triangle drawn on the diagram M1 for the word reflection A1 $y = -x$ oe Combined transformation must be fully correct to the specified answer but -1 once for the details (e.g. centre, angle, etc) B1 each column or M1 solving two pairs of sim. equations A1 all correct in matrix</p> |
| 20 | <p>(a) 12900</p> <p>(b) 23300</p> <p>(c) (i) 2.33×10^{13} (ii) 1.55×10^{13}</p> | <p>3 1√ 1√ 2√</p> | <p>M1 $(160^2 \text{ or } 100^2) \times \pi \times 95/360$ M1 subtracting the two areas above (a) multiplied by 1.8 (b) $\times 10^9$ M1 (c)(i) / 1.5</p> |

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| 21 | (a) 11.3 | 5 | <p>B1 identifying angle FAC M1 $600^2 + 800^2$ A1 1000 (for AC) M1 $\tan x = 200/\text{their } 1000$ (or $\cos x = "1000"/"1020"$) Alternative method via DF and AF M1 $"(200^2 + 600^2)" + 800^2$ A1 1020 M1 $\sin x / (\sin 90) = 200/"1020"$ oe cosine rule also possible</p> |
| | (b) 233 | 3 | <p>M1 $\tan y = 800/600$ oe $\sin y, \cos y$ M1 an angle found in (b) + 180 written in working</p> |