

**MARK SCHEME for the May/June 2014 series**

|                         |                                      |
|-------------------------|--------------------------------------|
| <b>0581 MATHEMATICS</b> |                                      |
| <b>0581/32</b>          | Paper 3 (Core), maximum raw mark 104 |

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, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

|               |                              |                 |
|---------------|------------------------------|-----------------|
| <b>Page 2</b> | <b>Mark Scheme</b>           | <b>Syllabus</b> |
|               | <b>IGCSE – May/June 2014</b> | <b>0581</b>     |

**Abbreviations**

- cao correct answer only
- dep dependent
- FT follow through after error
- isw ignore subsequent working
- oe or equivalent
- SC Special Case
- nfww not from wrong working
- soi seen or implied

| Qu                                       |            | Answers                                   | Mark   | Part Answers |   |
|--|------------|---|--|--------------|---|
| <b>1</b>                                 | <b>(a)</b> | <b>(i)</b> 5 and 9 cao                    | <b>1</b>                                     |              |   |
|  |            | <b>(ii)</b> 4 and 9 cao                   | <b>1</b>                                     |              |   |
|  |            | <b>(iii)</b> 8 cao                        | <b>1</b>                                     |              |   |
|  |            | <b>(iv)</b> 2 and 5 cao                   | <b>1</b>                                     |              |   |
|  | <b>(b)</b> | <   | <b>2</b>                                     |              | <b>B1</b> for 3 correct   |
|  |            | =   |  |              |   |
|  |            | <   |  |              |   |
|  |            | >   |  |              |   |
|  | <b>(c)</b> | <b>(i)</b> $(16 + 8) \div 4 - 2 = 4$      | <b>1</b>                                     |              |   |
|  |            | <b>(ii)</b> $16 + 8 \div (4 - 2) = 20$    | <b>1</b>                                     |              |   |
|  | <b>(d)</b> | <b>(i)</b> $2 \times 2 \times 3 \times 7$ | <b>2</b>                                     |              | <b>B1</b> for 2, 3, 7 or 2, 2, 3, 7, or $1 \times 2 \times 2 \times 3 \times 7$                                   |
|  |            | <b>(ii)</b> 12                            | <b>2</b>                                     |              | <b>B1</b> for 2, 3, 4 or 6 or $2 \times 2 \times 3$ or $2^2 \times 3$ or $4 \times 3$ or $2 \times 6$ seen as ans |
|  |            | <b>(iii)</b> 168                          | <b>2</b>                                     |              | <b>B1</b> for any other multiple of 168 or $2 \times 2 \times 2 \times 3 \times 7$ oe                             |
|  | <b>(e)</b> | <b>(i)</b> 19                             | <b>1</b>                                     |              | any other terms must be correct   |
| <b>(ii)</b> +4 oe                        |            | <b>1</b>                                  | e.g. add 4                                   |              |   |
| <b>(iii)</b> $4n - 1$ oe final answer    |            | <b>2</b>                                  | <b>B1</b> for $4n + k$ , $qn - 1$ $q \neq 0$ |              |   |
| <b>(iv)</b> accept any correct statement |            | <b>1</b>                                  |  |              |   |

|        |                       |          |
|--------|-----------------------|----------|
| Page 3 | Mark Scheme           | Syllabus |
|        | IGCSE – May/June 2014 | 0581     |

|     |   |                       |   |   |
|-----|---|-----------------------|---|---|
| 2   | (a) (i)   | Trapezium             | 1   |   |
|     | (ii)  | 25 200                | 2   | SCB3 for 2.52 m <sup>2</sup><br>M1 for $\left(\frac{180+240}{2}\right) \times 120$<br>or $180 \times 120 + \frac{1}{2} \times 120 \times 60$<br>or $\left(\frac{1.8+2.4}{2}\right) \times 1.2$ or $1.8 \times 1.2 + \frac{1}{2} \times 1.2 \times 0.6$ oe |
|     |   | cm <sup>2</sup>       | 1   |   |
|     | (iii)   | 6.3                   | 2   | M1 for <i>their</i> (a)(ii) $\times 2.5$ oe or figs 63  |
|     | (iv)  | 134 or 134.1 to 134.2 | 3   | B1 for 60 seen on diagram or used<br>M1 for $120^2 + (\text{their '240 - 180'})^2$ or better  |
| (b) | correct angle bisector of angle <i>J</i><br>with two pairs of supporting arcs<br><br>arc centre <i>H</i> radius 4 cm<br><br>correct region shaded | 2                     | M1 for the correct angle bisector of angle <i>J</i> without arcs  |   |
|     |   | 2                     | M1 for any arc centre <i>H</i>  |   |
|     |   | 1                     | dep on at least both M marks  |   |
| 3   | (a)   | correct mirror line   | 1   |   |
|     | (b)   | 2                     | 1   |   |
|     | (c) (i)   | 131                   | 1   |   |
|     | (ii)  | 103                   | 2   | M1 for $180 - 49 - 54$ or $49 + 54$ or 77 seen or fully correct method  |
|     | (d)   | 56                    | 2   | M1 for $180 - 90 - 34$ or better or indication of angle <i>B</i> = 90   |
| (e) | 9 with supporting working   | 5                     | M2 for internal angle of P = 120<br>or M1 for $180 - (360 \div 6)$ or $(6 - 2) \times 180 \div 6$<br><br>M1FT for $360 - \text{their '120'} - 100$ [= 140]<br><br>M1FT for $360 \div (180 - \text{their '140'})$<br><br>if M0 then answer of 9 scores SC2 |   |

|        |                       |          |
|--------|-----------------------|----------|
| Page 4 | Mark Scheme           | Syllabus |
|        | IGCSE – May/June 2014 | 0581     |

|     |         |   |  |   |
|-----|---------|---|--|---|
| 4   | (a) (i) | 2   | 1  |   |
|     | (ii)    | 4 and a half circles  | 1FT  | FT is 9 / <i>their a(i)</i> if <i>their a(i)</i> is an integer  |
|     | (b) (i) | 1   | 1FT  |   |
|     | (ii)    | 2 cao   | 1  |   |
|     | (iii)   | 6 cao   | 1  |   |
|     | (iv)    | $\frac{13}{46}$ oe isw  | 2  | M1 for 13 seen or $(6 + 5 + 2)/46$ or $6\frac{1}{2}/23$   |
|     | (c) (i) | four points correctly plotted   | 2  | M1 for 3 points correctly plotted   |
|     | (ii)    | continuous ruled line of best fit   | 1  | dependent on at least 9 points on graph   |
|     | (iii)   | positive  | 1  |   |
|     | (iv)    | 65 to 70  | 1FT  |   |
| (v) | E       | 1   | FT their continuous ruled line of best fit if positive |   |
| 5   | (a) (i) | 461.7(0) cao  | 1  |   |
|     | (ii)    | 397.06 or 397.1 or 397 or 397.062   | 2FT  | M1FT for <i>their (a)(i)</i> $\times 0.86$ oe soi   |
|     | (iii)   | 6880 or 6882 or 6882.(...)  | 2FT  | M1FT for <i>their (a)(ii)</i> $\div 3$ soi or <i>their (a)(ii)</i> $\times 52$ soi  |
|     | (iv)    | 84  | 2  | M1 for $140 \times 3 \div (3 + 2)$  |
|     | (b)     | 124 cao   | 3  | B2 for 124.3(.....) or 124.4<br>if B0 then M1 for $10\ 000 \div 80.4$<br><br>B1 for rounding their answer, if decimal, to the nearest integer |
| 6   | (a)     | 5 12  | 2  | B1, B1  |
|     | (b)     | 9 points plotted correctly<br><br>correct smooth curve through all 9 correct points | 3FT<br><br>1   | B2FT for 7 or 8 points correctly plotted<br>B1FT for 5 or 6 points correctly plotted  |
|     | (c)     | correct ruled line  | 1  | minimum length must touch y axis and curve  |
|     | (d)     | 2.7 to 2.8  | 1FT  | FT their curve and ruled line   |

|        |                       |          |
|--------|-----------------------|----------|
| Page 5 | Mark Scheme           | Syllabus |
|        | IGCSE – May/June 2014 | 0581     |

|     |       |  |  |   |   |
|-----|-------|--|--|---|---|
| 7   | (a)   | $13p - r$ Final Answer                               | 2  | <b>B1</b> for either $13p$ or $-r$ in the answer or $13p - r$ spoilt  |   |
|     | (b)   | 198  | 2  | <b>M1</b> for $12 \times 16 - 2 \times -3$<br>or <b>B1</b> for 192 or + 6 or $-(-6)$ seen   |   |
|     | (c)   | (i)  | 6.4 or $6\frac{2}{5}$                            | 1   |   |
|     |       | (ii)   | -3   | 2   | <b>M1</b> for first correct step, i.e. $5b = 8 - 23$ or better, or $b + \frac{23}{5} = \frac{8}{5}$ or better |
|     | (iii) | -9   | 3  | <b>B1</b> for $2c - 20$<br><b>M1FT</b> for correctly collecting $cs$ on one side and numbers on the other, e.g. $5c - 2c = -7 - 20$ or better |   |
|     | (d)   | (i)  | $16x + 24$                                       | 1   |   |
|     |       | (ii)   | $6x(x - 2)$                                      | 2   | <b>B1</b> for $x(6x - 12)$ , $6(x^2 - 2x)$ , $2(3x^2 - 6x)$ , $3(2x^2 - 4x)$ , $2x(3x - 6)$ or $3x(2x - 4)$   |
| (e) | (i)   | $15q^6$  | 2  | <b>B1</b> for $15q^n$ ( $n$ not 0) or $kq^6$ ( $k$ not 0)   |   |
|     | (ii)  | $t^6$  | 1  |   |   |
| 8   | (a)   | (i)  | $\begin{pmatrix} 10 \\ -15 \end{pmatrix}$        | 1   |   |
|     |       | (ii)   | $\begin{pmatrix} 7 \\ -6 \end{pmatrix}$          | 1   |   |
|     | (b)   | $\begin{pmatrix} -4 \\ 5 \end{pmatrix}$              | 1  |   |   |
|     | (c)   | (3,1)  | 1  |   |   |
| 9   | (a)   | (i)  | correct reflection at (1,-1), (3,-1) and (3,-5)  | 1   |   |
|     |       | (ii)   | correct rotation at (-1,-1), (-3,-1) and (-3,-5) | 2   | <b>SC1</b> for correct rotation any centre  |
|     |       | (iii)  | correct translation at (-4,4), (-2,4) and (-2,8) | 2   | <b>B1</b> for one direction correct, i.e. 5 left or 3 up  |
|     | (b)   | enlargement<br>[ centre ] (0,1)<br>[ scale factor] 2 | 1<br>1<br>1                                      |   |   |