

## **MARK SCHEME for the May/June 2013 series**

### **0580 MATHEMATICS**

**0580/12**

Paper 1 (Core), maximum raw mark 56

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.

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### Abbreviations

|     |                            |
|-----|----------------------------|
| cao | correct answer only        |
| cso | correct solution only      |
| dep | dependent                  |
| ft  | follow through after error |
| isw | ignore subsequent working  |
| oe  | or equivalent              |
| SC  | Special Case               |
| www | without wrong working      |
| soi | seen or implied            |

| Qu     | Answers                                           | Mark        | Part Marks                                                                              |
|--------|---------------------------------------------------|-------------|-----------------------------------------------------------------------------------------|
| 1      | 0.65 cao                                          | 1           |                                                                                         |
| 2      | 343                                               | 1           |                                                                                         |
| 3      | 29                                                | 1           |                                                                                         |
| 4      | 10800                                             | 1           |                                                                                         |
| 5      | cuboid                                            | 1           | Accept [rectangular] prism.                                                             |
| 6      | Overlapping class intervals oe                    | 1           |                                                                                         |
| 7 (a)  | Any acute angle with angle indicated              | 1           |                                                                                         |
| (b)    | Obtuse                                            | 1           |                                                                                         |
| 8      | 10, 15                                            | 1, 1        | If 10 not correct allow <b>SC1</b> for $x, x + 5$                                       |
| 9      | 0.25 oe                                           | 2           | <b>M1</b> for $1 - (0.45 + 0.3)$ or better<br>or<br><b>SC1</b> for 0.52 as final answer |
| 10 (a) | $\begin{pmatrix} 24 \\ 42 \end{pmatrix}$          | 1           |                                                                                         |
| (b)    | $\begin{pmatrix} -1 \\ 9 \end{pmatrix}$           | 1           |                                                                                         |
| 11     | 10.5 www                                          | 2           | <b>M1</b> for $42 = \frac{1}{2} \times BC \times 8$ or better                           |
| 12 (a) | 5.17225...                                        | 1           |                                                                                         |
| (b)    | 5.2                                               | 1FT         | <b>FT</b> <i>their</i> (a)                                                              |
| 13 (a) | $108^\circ$                                       | 1           |                                                                                         |
| (b)    | $3 \times 108 \neq 360$ oe                        | 1           |                                                                                         |
| 14     | Enlargement<br>[Centre] (5,4)<br>[Scale factor] 3 | 1<br>1<br>1 |                                                                                         |

|               |                              |                 |              |
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| Qu            | Answers                                                                                   | Mark     | Part Marks                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>15 (a)</b> | 52                                                                                        | <b>2</b> | <b>M1</b> for 180 – 128<br>or 128 or 52 marked on diagram in a correct position.                                                                                                           |
| <b>(b)</b>    | 22                                                                                        | <b>1</b> |                                                                                                                                                                                            |
| <b>16 (a)</b> | $3.844 \times 10^5$                                                                       | <b>1</b> | <b>B1</b> for figs 455 seen                                                                                                                                                                |
| <b>(b)</b>    | $4.55 \times 10^8$                                                                        | <b>2</b> |                                                                                                                                                                                            |
| <b>17 (a)</b> | <                                                                                         | <b>1</b> |                                                                                                                                                                                            |
| <b>(b)</b>    | >                                                                                         | <b>1</b> |                                                                                                                                                                                            |
| <b>(c)</b>    | <                                                                                         | <b>1</b> |                                                                                                                                                                                            |
| <b>18 (a)</b> | –4, –7, [+5] in any order                                                                 | <b>1</b> | <b>M1</b> for –10 and –12 seen<br><b>SC1</b> for –10 +12 seen                                                                                                                              |
| <b>(b)</b>    | –22                                                                                       | <b>2</b> |                                                                                                                                                                                            |
| <b>19</b>     | with 2 correct steps seen<br>$\frac{18k}{35k}$                                            | <b>3</b> | <b>B1</b> for $\frac{5k}{3k}$<br>and <b>M1</b> for $\frac{6}{7} \times their \frac{3}{5}$                                                                                                  |
| <b>20 (a)</b> | Angle or triangle [in a] semi-circle                                                      | <b>1</b> | <b>M1</b> for $\pi \times 1.5^2$ seen                                                                                                                                                      |
| <b>(b)</b>    | 7.068 to 7.07                                                                             | <b>2</b> |                                                                                                                                                                                            |
| <b>21</b>     | 6632.55 cao final answer                                                                  | <b>3</b> | <b>M2</b> for $6250 \times \left(1 + \frac{2}{100}\right)^3$ oe<br><br><b>or M1</b> for $6250 \times \left(1 + \frac{2}{100}\right)^2$ oe<br><br><b>SC2</b> for answer 382.55 final answer |
| <b>22</b>     | 14.5 oe                                                                                   | <b>3</b> | <b>M2</b> for complete correct method<br>or <b>M1</b> for one correct step                                                                                                                 |
| <b>23 (a)</b> | 1                                                                                         | <b>1</b> | <b>M2</b> for $v^2 = \frac{2E}{m}$<br><br><b>or M1</b> for $mv^2 = 2E$ or $\frac{1}{2} v^2 = \frac{E}{m}$                                                                                  |
| <b>(b)</b>    | $[v =] \sqrt{\frac{2E}{m}}$ or $\sqrt{\frac{E}{0.5m}}$ or $\sqrt{\frac{E}{\frac{1}{2}m}}$ | <b>3</b> |                                                                                                                                                                                            |

|               |                              |                 |              |
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| <b>Qu</b>         | <b>Answers</b>                      | <b>Mark</b> | <b>Part Marks</b> |
|-------------------|-------------------------------------|-------------|-------------------|
| <b>24 (a) (i)</b> | P in correct position at $(-5, -2)$ | <b>1</b>    |                   |
| <b>(ii)</b>       | $y = 2x$ drawn                      | <b>1</b>    |                   |
| <b>(b) (i)</b>    | 2                                   | <b>1</b>    |                   |
| <b>(ii)</b>       | S rotated correctly                 | <b>2</b>    |                   |

**SC1** if rotated 90acw or 90cw about wrong centre.