

**MARK SCHEME for the May/June 2010 question paper  
for the guidance of teachers**

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| <p><b>0580 MATHEMATICS</b></p> <p><b>0580/12</b>      Paper 12 (Core), maximum raw mark 56</p> |
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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 must be read in conjunction with the question papers and the report on the examination.

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| Qu. | Answers   | Mark        | Part Marks   |
|-----|---|-------------|--|
| 1   | 119   | 1           |  |
| 2   | (a) 24<br>(b) (24), 48, 72, 96  | 1<br>1      | SC1 for ans (48), 96 if their (a) is 48.   |
| 3   | $3p(2m - 3q)$ final answer  | 2           | W1 for $3(2mp - 3pq)$ or $p(6m - 9q)$ or $3p(am \pm bq)$ where $a$ and $b$ are integers.   |
| 4   | $\frac{7}{20}$ or equivalent fraction isw www                           | 2           | M1 for $\frac{2 \times 4}{4 \times 5} + \frac{5 \times 1}{4 \times 5}$ or $\frac{8}{20} + \frac{5}{20}$ or $0.4 + 0.25$<br>or $1 - \frac{8}{20} - \frac{5}{20}$ or $1 - 0.4 - 0.25$ or $40 + 25$<br>or $400 + 250$ or $1000 - 400 - 250$ seen<br>If M0 then SC1 for $\frac{7}{20}$ with no, incomplete or wrong working.<br>Condone if followed by 0.35 or 35% |
| 5   | (a) 22 10, 22:10, 22.10, 10 10pm<br>(b) 11(h) 35(min)                   | 1<br>1ft    | Follow through time period from their (a) to 09 45   |
| 6   | 1904  | 2           | M1 for $400 \times 4.76$   |
| 7   | 66.5  | 2<br>cao    | W1 for figs 665<br>or SC1 answer of $66.5 < LB < 67.5$   |
| 8   | $(\pm)\sqrt{m+2}$ final answer  | 2           | W1 for $p^2 = m + 2$<br>or ft square root after incorrect first step(s).<br>SC1 answer of $(\pm)\sqrt{m+2}$  |
| 9   | (a) (0)34 to (0)36<br>(b) 286 to 289                                    | 1<br>1      |  |
| 10  | (a) 6<br>(b) 520  | 1<br>2      | M1 for $5 \times 10^2 - 10 \times -2$ , or better<br>If zero, SC1 for answer of 480 or 2520  |
| 11  | (a) Line of fit by eye<br>(b) Negative<br>(c) Older children run faster | 1<br>1<br>1 |  |
| 12  | (a) -3<br>(b) (i) $p^5$<br>(ii) $m^{-4}$ or $\frac{1}{m^4}$             | 1<br>1<br>1 |  |

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|    |  |                 |   |
|----|--|-----------------|---|
| 13 | (a) 0.08259(.....)   | 1               | <b>W1</b> for their figs 826, i.e. to 3 sig figs<br><b>(a)</b> must have a minimum of 4 figures in order to qualify for this mark.<br>or <b>W1 ind</b> for their <b>(a)</b> in standard form. |
|    | (b) $8.26 \times 10^{-2}$  | 2ft             |   |
| 14 | $(x) = 7, (y) = 3, www$  | 3               | <b>M1</b> for multiplying and subtracting or adding as appropriate.<br>(allow errors in arithmetic operations)<br>or any other correct methods<br><b>A1</b> for one correct variable.         |
| 15 | Rectangle width 1.5 cm.  | 1               | in a correct place  |
|    | Rectangle width 1 cm.  | 1               | in a correct place  |
|    | Accurately drawn cross-section piece   | 1               | in a correct place  |
| 16 | (\$)282.56(...)  | 3               | <b>M1</b> for $2500 \times 1.055^2$ oe 2782(. ...)<br><b>and M1 dep</b> for subtracting 2500  |
| 17 | (a) D  | 1               |   |
|    | (b) E  | 1               |   |
|    | (c) G  | 1               |   |
|    | (d) F  | 1               |   |
| 18 | (a) Translation $\begin{pmatrix} 7 \\ -6 \end{pmatrix}$  | 2               | <b>W1 cao</b> for translation (allow poor spelling)<br><b>or W1 independent</b> for correct vector alone.   |
|    | (b) Correct rotation<br>(4, 4), (5, 4), (5, 2) and (2, 4)  | 2               | <b>W1</b> for (2, 4) missed but other points correct<br><b>or SC1</b> for 90 anti-clockwise rotation<br><b>or SC1</b> correct rotation, any other centre                                      |
| 19 | (a) 98.1 or<br>98.13 to 98.14  | 3               | <b>M1</b> for $14 \times 6 (+.....)$<br><b>M1 ind</b> for $\pi \times 3^2 \div 2$   |
|    | (b) 19.6 or<br>19.62 to 19.63  | 2ft             | <b>M1</b> for their <b>(a)</b> $\times$ figs 2<br>Figs 196.... implies <b>M1</b>  |
| 20 | (a) Two parallel straight lines<br>7 cm long and 4 cm from <i>AB</i> <b>and</b><br>two semicircular ends 4 cm from <i>A</i><br>and from <i>B</i> . | 2               | <b>W1</b> for 2 correct lines or 2 semicircles.   |
|    | (b) 391 or<br>391.3 to 391.4   | 3<br><b>cao</b> | <b>M1</b> for $2 \times 70$ soi<br><b>and M1 ind</b> for $2 \times \pi \times 40$<br><b>SC2</b> for answer of 39.1 or 39.13 to 39.14  |