

**MARK SCHEME for the October/November 2009 question paper  
for the guidance of teachers**

|                |   |
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| <b>0580/03</b> | <b>0580 MATHEMATICS</b><br>Paper 3 (Core), maximum raw mark 104 |
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| Qn | Answers | Mark  | Notes     |   |
|----|---------|---|-----------|---|
| 1  | (a) (i) | 1/5   | 1         | Accept 0.2 or 20%   |
|    | (ii)    | 2/5   | 1         | Accept 0.4 or 40%   |
|    | (iii)   | 0   | 1         | Accept 0/5 or 0%  |
|    | (b) (i) | 6   | 1         | cao   |
|    | (ii)    | 1   | 1         | cao   |
|    | (iii)   | 2.6 (0) www   | 3         | M1 for $1 \times 8 + 2 \times 4 + 3 \times 5 + 4 \times$ their<br><b>(b) (i)</b> + $5 \times 2$<br>M1 dep for $\div 25$ or their 25 |
|    | (iv)    | heights 8, 4, 5, , 2<br>6 or ft height for their <b>(b) (i)</b> | 2<br>1 ft | SC1 for one error, or small gaps  |
| 2  | (a) (i) | 15.7 art  | 2         | M1 for $2 \times \pi \times 2.5$  |
|    | (ii)    | 19.6 art  | 2         | M1 for $\pi \times 2.5^2$   |
|    | (iii)   | 14.6 art  | 2         | M1 for $\pi \times (2.5 + 0.8)^2$   |
|    | (b)     | Within range 7840 to 7860                                       | 2 ft      | M1 for their <b>(a) (ii)</b> $\times 0.4 \times 1000$   |
|    | (c)     | 31  | 3 ft      | M1 for their <b>(b)</b> $\div 250$ soi<br>A1 ft for 31.4 art<br>W1 for their answer correctly rounded                               |
| 3  | (a) (i) | 4.5   | 2         | M1 for $15 \times 3 / (7+3)$  |
|    | (ii)    | 3   | 1 ft      | Their <b>(a) (i)</b> $\div 2$ and rounded up  |
|    | (b) (i) | 8.14  | 3         | M1 for $100 - 12$ soi<br>M1 for $9.25 \times$ their $88 / 100$  |
|    | (ii)    | 32.56   | 1 ft      | $4 \times$ their <b>(b) (i)</b>   |
|    | (iii)   | 46.25   | 1         | cao   |
|    | (iv)    | 8.75(6...) or 8.76  | 3         | M1 for (their <b>(ii)</b> + their <b>(iii)</b> ) soi<br>$2^{\text{nd}}$ M1 dep for $\div (4 + 5)$ soi                               |

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|             |                  |  |   |   |
|-------------|------------------|--|---|---|
| <b>4</b>    | <b>(a) (i)</b>   | Isosceles  | 1   | Condone spelling  |
|             | <b>(ii)</b>      | <i>DNC</i>   | 1   | Condone order of letters  |
|             | <b>(iii)</b>     | 70°  | 1   | cao   |
|             | <b>(b) (i)</b>   | 49.4° or 49°24' art  | 2   | M1 for inv tan (7/6)  |
|             | <b>(ii)</b>      | 9.22 art   | 2   | M1 for $\sqrt{(6^2 + 7^2)}$ soi (e.g. $\sqrt{85}$ )                         |
|             | <b>(c)</b>       | 12.2 art   | 3   | M2 for 7/sin35  |
|             | <b>(d)</b>       | 42.8(4....) or 42.85   | 2 ft  | M1 for $2 \times$ [their <b>(b) (ii)</b> + their <b>(c)</b> ] oe            |
| <b>5</b>    | <b>(a)</b>       | 2 -6 2   | 1, 1, 1   |   |
|             | <b>(b)</b>       | seven points correctly plotted<br>smooth correct curve through 7 correct<br>points | P3ft<br>C1  | 5 or 6 P2ft, 3 or 4 P1ft  |
|             | <b>(c) (i)</b>   | (-2, -7)   | 1   | cao   |
|             | <b>(ii)</b>      | -4.6 to -4.75<br>and 0.6 to 0.75   | 1<br>1  | cao<br>cao  |
|             | <b>(d) (i)</b>   | correct point marked   | 1   | Condone lack of label   |
|             | <b>(ii)</b>      | <u>ruled</u> line from their <i>A</i> to their (0, -3)                             | 1   | <u>Continuous</u> line of this minimum length                               |
|             | <b>(iii)</b>     | -4 / 2 oe  | 2   | M1 for attempt at gradient<br>or<br>SC1 for 2 oe or -1 oe from correct line |
| <b>(iv)</b> | $y = -2x - 3$ oe | 2  | SC1 for $y = kx - 3$ oe or $y = -2x + k$ oe<br>or $y =$ their <b>(d) (iii)</b> $x + k$ oe |   |

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|----------|----------------|--|-----------------|---|
| <b>6</b> | <b>(a)</b>     | $x + 4$  | 1               |   |
|          | <b>(b)</b>     | $3x$   | 1               |   |
|          | <b>(c) (i)</b> | $x + x + 4 + 3x$<br>$5x + 4$   | M1 ft<br>A1 cao | soi ft is $x + (a) + (b)$<br>$5x + 4$ www scores both marks                                 |
|          | <b>(ii)</b>    | Their <b>c (i)</b> $\div 3 = 28$ or their <b>c (i)</b> $= 28 \times 3$ | 1               |   |
|          | <b>(iii)</b>   | $(x =) 16$   | 2               | M1 for $5x = 84 - 4$ or $5x = 80$ or $x = 80/5$   |
|          | <b>(d)</b>     | 48 or $3 \times$ their $x$   | 1 ft            | Ft is $3 \times$ <b>(c) (iii)</b>   |
|          | <b>(e)</b>     | 84%  | 2               | M1 for $63 / 75 \times 100$   |
| <b>7</b> | <b>(a)</b>     | 4  | 1               | cao   |
|          | <b>(b)</b>     | 4 correct lines drawn, accept reasonable freehand                      | 2               | SC1 for 2 correct lines   |
|          | <b>(c)</b>     | 2600   | 3               | M1 for $2800 \times 1.75$ or 4900<br>M1 for their $4900 - 2300$                             |
|          | <b>(d)</b>     | 3100.40  | 2               | M1 for $2300 \times 1.348$  |
|          | <b>(e)</b>     | 5962.32  | 3               | M2 for $5000 \times (1.092)^2$<br>SC1 for $5000 \times (1.92)^2$ or full equiv.<br>or 18432 |

|               |                                       |                 |              |
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|          |                |  |            |  |
|----------|----------------|--|------------|--|
| <b>8</b> | <b>(a) (i)</b> | Correct X  | 2          | SC1 for translation of $\begin{pmatrix} 2 \\ -7 \end{pmatrix}$   |
|          | <b>(ii)</b>    | Correct Y  | 2          | SC1 for rotation through 90 clockwise<br>Or 90 anticlockwise about any point                                 |
|          | <b>(b) (i)</b> | Correct $Z_1$  | 2          | SC1 for reflection in $y$ axis<br>Or in any horizontal line  |
|          | <b>(ii)</b>    | Correct $Z_2$  | 2 ft       | strict ft <b>reflection</b> of their $Z_1$ if possible<br>SC1 for reflection in $y = 4$ or any vertical line |
|          | <b>(iii)</b>   | Translation, $\begin{pmatrix} 8 \\ 4 \end{pmatrix}$<br>OR Rotation, through 180 about (4, 0) | 1, 1       | W1 transformation, W1 full description<br>SC2 for Enlargement $sf = -1$ coe (4, 0)                           |
| <b>9</b> | <b>(a)</b>     | 13 21<br>10 15   | 1 1<br>1 1 | cao<br>cao   |
|          | <b>(b)</b>     | 43<br>28   | 1<br>1     | cao<br>cao   |
|          | <b>(c) (i)</b> | $\frac{1}{2} \times 5 \times 6$<br>= 15 seen   | 1<br>1dep  | accept $\frac{1}{2} \times 5 \times (5 + 1)$   |
|          | <b>(ii)</b>    | $\frac{1}{2} \times 20 \times 21$<br>= 210   | 1<br>1     | accept $\frac{1}{2} \times 20 \times (20 + 1)$<br>accept 210 www for both marks                              |
|          | <b>(d)</b>     | (k =) -1   | 2          | M1 for $7 = 3^2 + k \times 3 + 1$ oe   |