

**MARK SCHEME for the May/June 2011 question paper**  
**for the guidance of teachers**

**0580 MATHEMATICS**

**0580/23**

Paper 2 (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, 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.

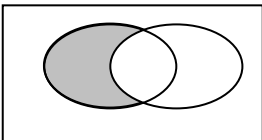
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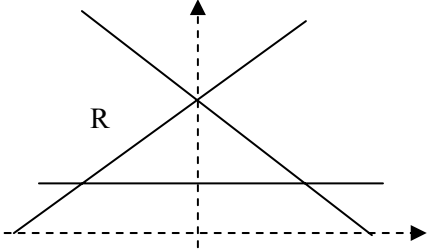
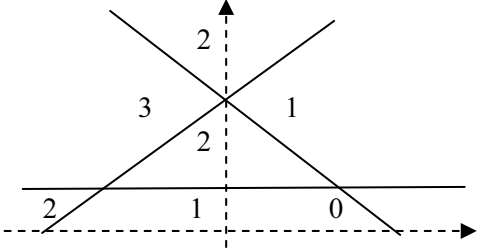
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### Abbreviations

|     |                            |
|-----|----------------------------|
| 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      |

| Qu.   | Answers   | Mark | Part Mark  |
|-------|---|------|--|
| 1     | $2y(x - 2z)$  | 2    | <b>B1</b> for $y(2x - 4z)$ or $2(xy - 2yz)$  |
| 2     | $(x =) 3(y - 5)$ oe final answer  | 2    | <b>M1</b> for correct first move<br>$y - 5 = \frac{x}{3}$ or $3y = x + 15$<br><b>M1</b> for their correct second move    |
| 3 (a) |  | 1    |  |
| (b)   | 14  | 1    |  |
| 4     | 816 cao   | 2    | <b>M1</b> 197.5 and 210.5 seen   |
| 5     | $a$ any negative integer<br>$n$ any even (positive) integer                       | 2    | <b>B1</b> for one correct  |
| 6 (a) | $1.646 \times 10^7$   | 1    |  |
| (b)   | $3.32 \times 10^{-2}$   | 2    | <b>B1</b> for 0.0332 seen or $3.3 \times 10^{-2}$ as answer<br>or <b>B1</b> for $3.32 \times 10^k$                       |
| 7 (a) | 36  | 1    |  |
| (b)   | correct working   | 2    | <b>M1</b> for $\frac{7}{6}$ oe improper fraction<br><b>M1</b> for $\frac{12}{21} = \frac{4}{7}$ oe or visible cancelling |
| 8     | $(x =) 5$ $(y =) -1$  | 3    | <b>M1</b> for consistent multiplication and add/subtract as appropriate<br><b>A1</b> for 1 correct answer                |
| 9     | 127.31 cao  | 3    | <b>M1</b> for $120 \times 1.03^2$<br><b>A1</b> for 127.308<br>If <b>M0</b> award <b>SC2</b> for 7.31 or 247.31           |
| 10    | 120   | 3    | <b>M1</b> $7t + 11(t + 5) = 2215$<br><b>A1</b> $18t + 55 = 2215$   |
| 11    | 500   | 3    | <b>M1</b> $V = kL^3$ any letters may be used for $V$ , $k$ and $L$<br><b>A1</b> $k = 4$                                  |

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|        |   |     |   |
|--------|---|-----|---|
| 12     | $\frac{840-x}{d}$ or $\frac{840}{d} - \frac{x}{d}$                                | 3   | M1 $400 \times 2.1$<br>M1 “ $400 \times 2.1$ ” – $x$  |
| 13     |  | 3   | Give the mark for R shown in region below<br> |
| 14     | $y = 4x + 1$  | 3   | B1 correct numerical $y = mx + c$<br>B1 $c = 1$<br>B1 $m = 4$   |
| 15     | 4.94  | 3   | M1 $\pi r^2 \times 12 = 920$<br>M1 $(r^2) = \frac{920}{\text{their } (\pi \times 12)}$  |
| 16     | $\frac{5x-2}{(x-2)(x+2)}$   | 3   | M1 $2(x+2) + 3(x-2)$ seen<br>B1 $(x-2)(x+2)$ common denom. seen   |
| 17 (a) | 4.5(0)  | 1   |   |
| (b)    | 200   | 2   | M1 $0.5^3$ or $2^3$ seen  |
| 18 (a) | $27x^9$   | 2   | B1 $kx^9$ or $27x^n$  |
| (b)    | $25x^4$   | 2   | B1 $kx^4$ or $25x^n$  |
| 19 (a) | 32  | 2   | B1 figs 32 or 1 cm to 2.5 km or 8 000 000 seen  |
| (b)    | 37.5  | 2   | B1 (figs 25) <sup>2</sup> seen or figs 375 in answer  |
| 20 (a) | 35  | 1   |   |
| (b)    | 55  | 1ft | 90 – (a) but $b > 0$  |
| (c)    | 55  | 1ft | = (b)   |
| (d)    | 125   | 1ft | 180 – (c)   |
| 21     | 96 www  | 5   | M1 $3^2 + 4^2$<br>A1 5<br>M1 $\frac{1}{2} \times 6 \times \text{“5”}$ (= 15)<br>M1 $4 \times \text{their triangle area} + 6^2$  |

|               |                                       |                 |              |
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|                |       |          |  |
|----------------|-------|----------|--|
| <b>22 (a)</b>  | 159   | <b>3</b> | <b>M1</b> evidence of using area under graph<br><b>M1</b> stating area correctly |
| <b>(b) (i)</b> | 50    | <b>2</b> | <b>M1</b> $3 \times (1000/60)$ oe  |
| <b>(ii)</b>    | 0.208 | <b>2</b> | <b>M1</b> evidence of numerical rise/run or use of $(v - u)/t$                   |