

MARK SCHEME for the May/June 2007 question paper

0580 and 0581 MATHEMATICS

0580/02 and 0581/02 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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

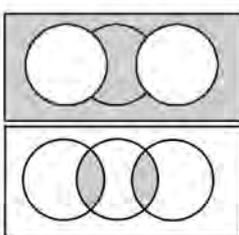
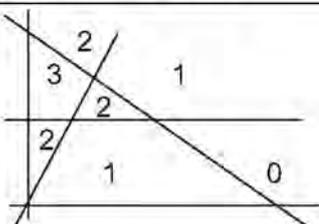
Mark schemes must be read in conjunction with the question papers and the report on the examination.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

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| Page 2 | Mark Scheme | Syllabus |
| | IGCSE – May/June 2007 | 0580 and 0581 |

* indicates that it is necessary to look in the working following a wrong answer

| | | | |
|----|---|---------|---|
| 1 | (a) 4 (b) 4 | 1 1 | |
| 2 | (a) 0.176 (b) 1.76×10^{-1} | 1 1√ | ft their answer to (a) |
| 3 | 0.512 or 64/125 | 2* | M1 0.8 x 0.8 x 0.8 leading to answer |
| 4 | tan100 , cos100, sin100 | 2* | M1 for correct conversion to decimals - 5.67, - 0.174, 0.985 2sf or better SC1 all correct but reversed |
| 5 | (a) 1/50 (b) 4.35 | 1 1 | cao Allow fraction |
| 6 | 135 165 cao | 1,1 | SC1 2h 15m and 2h 45m or 2.25 and 2.75 or 135 and 165 reversed or 4.5 and 5.5 seen |
| 7 | $\begin{pmatrix} 13 & 21 \\ 21 & 34 \end{pmatrix}$ | 2 | W1 for 13, 21 W1 for 21, 34 |
| 8 |  | 1 1 | |
| 9 | (a) any non square \sqrt or π or e (b) 61 or 67 | 1 1 | $\sqrt{5}$ but not $\sqrt{9}$. $\sqrt{2/3}$ is OK, sin20 etc but not sin30 No fractions, decimals or root of negatives allow 61 and 67 but no other pairs |
| 10 | $\frac{x^2 - 6x + 25}{4(x - 3)}$ | 3* | M1 $x^2 - 6x + 9$ M1 denom $4(x - 3)$ or $4x - 12$ seen |
| 11 | (a) $x^2 - 16$ cao (b) 5 and -5 www | 1 2* | allow $(x - 4)(x + 4)$ M1 $\sqrt{(a) = 9}$ and one correct completed operation |
| 12 |  | | Mark unshaded region SC1 correct region shaded and no label SC2 correct region shaded and labelled |
| 13 | 108 | 3* | M1 $y = k(x + 2)^3$ A1 $k = 4$ or M1 $y_1 / y^2 = x_1^3 / x_2^3$ A1 $y_1 / 32 = 27/8$ |

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| Page 3 | Mark Scheme | Syllabus |
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| | | | | |
|--------------|---|-----------|---|--|
| 14 | 7.31 | 3* | M1 $\cos 70 = 3.8 / (3.8 + x)$ M1 $1.3 + 0.342x = 3.8$ | M1 $\cos 70 = 3.8 / y$ M1 $x = "11.11" - 3.8$ |
| | | | M1 $y / \sin 70 = 7.6 / \sin 40$ M1 $x = "11.11" - 3.8$ | M1 cos rule M1 $1.3 + 0.342x = 3.8$ |
| 15 | (a) 12/18 oe (b) 3/12 oe | 1 | allow 0.667 or better | |
| | | 2* | W1 numerator 3 < W1 denominator 12 If B0, mark final fraction before cancellation | |
| 16 | (a) x cao (b) $9x - 4$ | 1 | | |
| | | 2* | M1 $3(3x - 1) - 1$ | |
| 17 | (a) 5/2 or 2.5 (b) -1 | 2* | M1 2^5 or $2^{5/2}$ | (b) SC1 -3/3 |
| | | 2* | M1 2^{-3} or $(1/8)^{1/3}$ or 2^{-1} (or $1/2$ in correct context) | |
| 18 | (a) $\frac{8 - 3x}{2}$ or $4 - 1.5x$ oe (b) -3/2 or -1.5 (c) (0, 4) | 2* | M1 any 2 operations completed correctly SC1 $(3x - 8) / -2$ | |
| | | 1√ | from their equation in (a) | |
| | | 1√ | from their equation in (a) | |
| 19 | (a) $w = 26$ $x = 128$ (b) $y = 52\sqrt{\quad}$ from incorrect x [$y = 52\sqrt{\quad}$ but no working scores B1] | 1,1 | | |
| | | 2* | E1 convincing explanation eg involving their x, OQT = OPT = 90 and angles in a quadrilateral | |
| 20 | Accurate perpendicular bisector of AB through P by construction [a correct line goes through P- no daylight] circle centre D radius 3cm \pm 1mm 320 to 332 | 2* | M1 two sets of correct arcs and a line joining or M1 one set of correct arcs and a line through P. A1 accurate line 2.4cm \pm 1mm from A or B W1 no arcs, accurate line 2.4cm \pm 1mm from A or B | |
| | | 1 | Must be a complete circle but can be dotted | |
| | | 1 | | |
| 21 | (a) 0.6 or 3/5 (b) 1170 | 1 | Allow 2.16 km/h ² provided units stated | |
| | | 3* | M1 one area based on t axis + one other correct M1 for finding the total area under the graph | |
| 22 | (a) 2300 (b) 8.64 | 2* | M1 $5 \times 2000 \times 3 \div 100$ | |
| | | 3* | M1 2000×1.049^3 oe (2098, 2200.80, 2308.64) dep M1 (for C I method) subtraction of (a) | |
| 23 | (a) 14.1 www (b) 24.8 | 4* | W1 $r = 3$ M1 $\frac{1}{2} \times \pi \times 6^2$ dep M1 $-\pi \times 3^2$ (or $\frac{1}{4} \times \pi \times 6^2$ and then $-\frac{1}{2} \times \pi \times 3^2$) [SC1 for $\frac{1}{2} \times \pi \times 12^2$ and dep SC1 $-\pi \times 6^2$] | |
| | | 2* | M1 $\frac{1}{4} \times 2 \times \pi \times 6 + \frac{1}{2} \times 2 \times \pi \times 3$ [SC1 $\frac{1}{4} \times 2 \times \pi \times 12 + \frac{1}{2} \times 2 \times \pi \times 6$] | |
| TOTAL | | 70 | | |