

MARK SCHEME for the May/June 2008 question paper

0580 and 0581 MATHEMATICS

0580/03 and 0581/03 Paper 3 (Core), maximum raw mark 104

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.

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|----------|----------------|--|----------------|---|
| 1 | (a) | 0.68 x 450 = 306 2 x 450 + 306 (= 1206) | M1 A1 M1 | dep allow 900 or 450 + 450 SCM3 for 2.68 x 450 (= 1206) |
| | (b) | 2814 | B3 | M1 for 1206 ÷ 6 (implied by 201) or 450 ÷ 6 or 306 ÷ 6 M1 dep for x (6 + 5 + 3) implied by 14 SCM2 for 1206 + 1005 + 603 |
| | (c) | 4955 | B2 | M1 for 500 x 9.91 implied by figs 4955 |
| | (d) | 2320 or 11 20 pm | B2 | SC1 for 1720 or 1120 seen SC1 for any arrival time + 6 soi |
| [10] | | | | |
| 2 | (a) | translation col.vector 2 -4 | B1 B1 B1 | SC1 for col.vectors 4 -8 or -4 2 or for (2, -4) |
| | (b) | reflection (in) $x = 0$ or y axis | B1 B1 | |
| | (c) | rotation 90° (anticlockwise) oe (about) origin oe | B1 B1 B1 | i.e. 1/4, 270 clockwise, - 270 accept (0,0), O |
| | (d) | enlargement (scale factor) -2 (centre) origin oe | B1 B1 B1 | SC1 for enlargement, SF=2, about origin (oe) and rotation of 180 about the origin (oe) |
| [11] | | | | |
| 3 | (a) (i) | 6,17,8,9,11,9 | B2 | B1 for 4 or 5 correct or for all tallies correct |
| | (ii) | correct bar chart | B1ft | ft from their frequency table or tallies |
| | (iii) | 2 | B1ft | from their table or chart |
| | (iv) | 3 | B1ft | from their table or chart |
| | (v) | 3.48 | B3cao | M1 for clear indication of $1 \times 6 + 2 \times 17 + 3 \times 8 + 4 \times 9 + 5 \times 11 + 6 \times 9$ ft imp by 209 M1 dep for ÷ 60 |
| | (b) | 66° | B2ft | M1 for "11" ÷ 60 x 360 or "11" x 6 |
| [10] | | | | |

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| 4 | (a) (i) | $3x = 14 + 4$ oe ($x =$) 6 | M1 A1cao | SC2 for 6 www |
| | (ii) | $y + 1 = 2 \times 5$ oe ($y =$) 9 | M1 A1cao | SC2 for 9 www |
| | (iii) | $6z - 21 - 2z + 6 (= -9)$ $4z = 6$ $z = 1.5$ | B1 B1ft B1cao | ft their expansion but must be 4 terms |
| | (b) (i) | $p + q = 12$ | B1 | |
| | (ii) | $25p + 40q = 375$ | B1 | |
| | (iii) | correct method $p = 7$ $q = 5$ | M1 A1 A1 | multiply and subtract, substitution SC3 for $p=7$ and $q=5$ www |
| | | | | [12] |
| 5 | (a) (i) | 43.0 art or 43 | B2 | M1 for $\pi \times 3.7^2$ |
| | (ii) | 10.0 art or 10 | B2ft | M1 for $430 \div$ their (a)(i) ft |
| | (b) (i) | (length) = 22.2 (width) = 14.8 (height) = 20 | B1 B1 B1ft | accept length and width interchanged ft is 2 x their (a)(ii) |
| | (ii) | 6570 art | B2 ft | ft is their L x W x H from (b)(i) M1 for L x W x H ft (substituted) |
| | (iii) | 78.5 (%) art | B3 ft | ft is $5160 \div$ their (b)(ii) x 100 but only if answer < 100 B1 for 12×430 or 5160 M1 for $5160 \div$ their (b)(ii) x 100 |
| | | | | [12] |
| 6 | (a) (i) | 63 | B1 | |
| | (ii) | 54 | B2 cao | M1 for $180 - 2 \times$ their (a)(i) soi (may be implied by answer) |
| | (iii) | 134 | B2 cao | M1 for $360 - (100 + 63 +$ their (a)(i) or $197 -$ their (a)(i) soi (may be implied by answer) |
| | (b) (i) | $360 \div 8$ or 6×180 $180 - 45$ or $1080 \div 8$ | MA1 MA1 | dependent SC2 for convincing argument |

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| | (ii) octagon drawn accurate | M1 A1 | closed and not re-entrant angles at A and B equal to 135 ± 2 degrees and lines BC and AH equal to 4 ± 0.1 cms |
| | (iii) 4.7 to 5.0 | B1 | |
| | (iv) 9.6 | B2ft | ft is 2 x their (b)(iii) M1 for $0.5 \times 4 \times$ their (b)(iii) |
| | (v) 76.8 | B1 ft | ft is 8 x their (b)(iv) |
| | | | [13] |
| 7 | (a) (i) $\tan(QPR) = 10.3 \div 7.2$ 55 (.0) | M1 E1 | M1 for complete long method |
| | (ii) 125 | B1 | cao |
| | (b) (i) 125 - 98 or $180 - (98 + 55)$ | E1 | accept $55 + 98 + 27 = 180$ do not accept $180 - 153$ |
| | (ii) 6.13 art | B2cao | M1 for $13.5 \times \sin 27$ oe (allow full correct long methods) SCM1 for PR (pythag, sin or cos) RS (pythag) then A1 for 4.9 art or SCM1 for PR (pythag, sin or cos) RS(tan) then A1 for 6.4 art. |
| | (iii) 37.1 or 37.13 art | B1 ft | ft is $31 +$ their (b)(ii) |
| | (c) 8.24 to 8.25(1....) | B2 ft | M1 for their (b)(iii) $\div 4.5$ |
| | | | [9] |
| 8 | (a) (i) $x + 3$ | B1 | |
| | (ii) $x(x + 3)$ or $x^2 + 3x$ | B1 | ft from their (a)(i) |
| | (iii) $x^2 + 3x = 7$ $x^2 + 3x - 7 = 0$ | E1 | both lines seen |
| | (b) (i) -3, -9, -3 | B3 | B1, B1, B1 |
| | (ii) 8 points correctly plotted smooth curve | P3 ft C1 | P2ft or 6 or 7, P1ft for 4 or 5 ($\pm 1/2$ small square) (must go below $y = -9$) |

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| (c) (i) | 1.5 to 1.6 -4.5 to -4.6 | B1 ft B1 ft | ft is their intersections with the x -axis |
| (ii) | 4.5 to 4.6 | B1 ft | ft is their positive (c)(i) + 3 |
| (d) (i) | correct line | L1 | long enough to cross y axis (+/- 1/2 small square) |
| (ii) | $(y =) 2x - 3$ | B1,B1ft | B1 for 2 (as coefficient of x) B1 ft for their intersection with the y -axis |
| [16] | | | |
| 9 (a) | Pentagon | B1 | |
| (b) (i) | 61 to 63 | B1 | |
| (ii) | AE = 6.3 to 6.5 cm and DE = 5.7 to 5.9 cm | B1 | |
| | correct arcs seen | B1 | accept concave polygon SC1 if lengths reversed and with arcs |
| (c) (i) | perpen.bisector of BC correct arcs seen | B1 B1 | +/- 1mm and +/- 1 degree accuracy |
| (ii) | bisector of angle ABC correct arcs seen | B1 B1 | +/- 1 degree accuracy |
| (d) | "M" correctly marked | B1 | dep. on at least first B1 in each part of (c) |
| (e) | 2 marks 0.8 (+/-0.1) apart 1.85 (+/-0.1) from A and B | B1 B1 | |
| [11] | | | |