

MARK SCHEME for the October/November 2008 question paper

0580 and 0581 MATHEMATICS

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

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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.

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Abbreviations

art	answer rounding to
cao	correct answer only
ft	follow through after an error
oe	or equivalent
soi	seen or implied
SC	Special Case

Qu	Answers	Mark	Part Marks
1 (a) (i)	$\frac{3}{5} \times 30\,000$ or $30\,000 - \frac{2}{5} \times 30\,000$	M1	Must see evidence of fractions
(ii)	Aida \$7500 Bernado \$6000 Christiano \$4500	W3	M1 for $\frac{5 \text{ or } 4 \text{ or } 3}{5+4+3} \times 18000$ A1 for 1 correct answer
(b) (i)	10 500	W2	M1 for $\frac{35}{100} \times 30\,000$ or $0.35 \times 30\,000$
(ii)	$\frac{13}{60}$	W2	W1 for $\frac{6500}{30000}$ seen or other 'correct' fraction.
(iii)	(\$13 000	W1ft	
(c)	24	W3cao	M1 for $15\,500 - 12500$ or $\frac{15500}{12500} \times 100$ M1 for $\frac{3000}{12500} \times 100$ or '124' – 100
2 (a) (i)	52.3 art	W2cao	M1 for $55\cos 18^\circ$
(ii)	24.4 art	W2 ft	M1 for '52.3' $\tan 25^\circ$. Ft their ED
(iii)	17.0 art	W2cao	M1 for $55\sin 18^\circ$ or $\sqrt{(55^2 - '52.3'^2)}$ or '52.3' $\tan 18^\circ$ Long methods, e.g. sine rule must be explicit and 'correct'.
(b)	'24.4' – '17.0' (= 7.4)	M1	Allow for clear attempt to find $FD - AD$.
(c) (i)	14.1 art	W2cao	M1 for $\sqrt{(12^2 + 7.4^2)}$ or correct long methods $12 \div \cos(\tan^{-1} \frac{7.4}{12})$ or $7.4 \div \sin(\tan^{-1} \frac{7.4}{12})$
(ii)	31.7 art	W2cao	M1 for $\tan(FBA) = \frac{7.4}{12}$ oe or $\sin FBA = \frac{7.4}{FB}$ or $\cos FBA = \frac{12}{FB}$
3 (a) (i)	12	W1	M1 for Attempt at ordering the data.
(ii)	7	W1	
(iii)	8.5	W2	
(b)	10 points correctly plotted	W3	W2 for 8 or 9 points correctly plotted W1 for 6 or 7 points correctly plotted

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(c) (i)	8.58(3...) or 8.6	W2	M1 for attempt at totalling data $\div 12$ Allow method if 1 error or omission, but must see an attempt (or judge implied) to divide by 12
(ii)	Plotted (their (c)(i) , 38.8)	W1ft	
(d) (i)	Line of fit	W1	Line must indicate understanding
(ii)	Negative	W1	
4 (a)	22° Tangent (and) radius/ diameter (meet at) 90°	W1cao W1	Degree symbol not essential throughout question. Allow perpendicular for 90°
(b)	90° (Angle in a) semi-circle	W1cao W1	
(c)	68° (Angles in a)triangle (=)180°	W1ft W1	Ft is 180 –(their (a) + their (b)) or alternate segment (theorem)
(d)	68° Alternate or Z (angles)	W1cao W1	Allow Z correctly placed on the diagram.
5 (a)	6	W1	
(b) (i)	10 30	W2	M1 for $\frac{15}{20}$ SC1 for 10 15
(ii)	Line from 09 30 to 0945 Line to ('10 30', 18)	W1 W1ft	accuracy ± 1 mm
(c) (i)	20	W1	
(ii)	Line (11 15, 0) to (their 11 35, 18)	W1ft	ft their time in (c)(i) provided in minutes and ≤ 45 Line (11 15, 0) to (11 [15 + '20'], 18)
(d) (i)	Line (12 00,18) to (12 45,0)	W1	
(ii)	24	W2	M1 for $18 \div 0.75$ Allow $18 \div 45 \times 60$ for method
6 (a) (i)	(y=)13	W2	M1 for $(2y=) 75 - 7 \times 7$
(ii)	(x=) 9	W2	M1 for $7x = 75 - 12$ or $-7x = 12 - 75$
(b)	$\frac{75-2y}{7}$ or $\frac{2y-75}{-7}$	W2	M1 for $7x + 2y = 75$. $7x = 75 - 2y$ or $-7x = 2y - 75$ or $-7x - 2y = -75$

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(c)	$(x =) 11, (y =) -1$	W3	M1 for multiply and correct add/subtract or correct substitution. A1 for $x = 11$ or $y = -1$
7 (a)	3, -3, 3	W3	W1 for each correct value
(b)	8 correctly plotted points Smooth curve	W3ft W1	W2 for 6 or 7 points, W1 for 4 or 5 points Half square accuracy must go below line $y = -3$
(c)	$(-0.5, -3.25)$	W2ft	W1 for one coordinate correct Ft their graph but $-1 < x < 0$ and $y < -3$ Allow calculated if exact values (W2 or W1)
(d) (i) (ii)	Line $x = -0.5$ drawn $x = -0.5$ oe	W1cao W1ft	Half square accuracy Ft any vertical line only
8 (a) (i) (ii)	$(-3, -2)$ $(AB =) \begin{pmatrix} 4 \\ 2 \end{pmatrix}, (BC =) \begin{pmatrix} -3 \\ 2 \end{pmatrix}$	W1 W1, W1	SC1 for $\begin{pmatrix} 2 \\ 4 \end{pmatrix}$ and $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$
(b)	$(1, -5), (5, -3), (2, -1)$	W2	W1 for 2 correct points plotted Must join points, with straight lines, for both marks.
(c) (i) (ii)	$P(5, 2), Q(-1, 6)$ Enlargement (Scale factor) 2 (Centre) A or $(-3, -2)$	W1, W1 W1ft W1 W1	Ft their (a)(i) Zero if not a single transformation
(d)	$(0, -4)$ marked Joined to A and B	W1 W1ft	Their image of C joined to A and B .
9 (a) (i) (ii)	99 to 101 (metres) 103° to 105°	W1 W1	
(b) (i)	Bisector of angle ABC $(45 \pm 1$ to $BC)$ with arcs Bisector of AD with arcs ± 1 mm from centre of AD and 89° to 91° to AD .	W2 W2	W1 correct bisector without arcs W1 correct bisector without arcs. Bisector about 89° to 91° to AD by eye and centre within 2mm by eye.
(ii)	Closed region T indicated	W1	Dependent on at least W1 for each bisector. Allow T omitted if region is clear.

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Qu	Answers	Mark	Part Marks
(c)	Lines parallel to and 3cm (± 0.1 cm) from AB and BC . Lines joined by arc, centre B . radius 3cm (± 0.1 cm)	W1 W1	
10 (a)	(Lines) 10 and 13 (Dots) 8 and 10	W1 W1	
(b)	(Lines) 31, (Dots) 22	W1, W1	
(c) (i)	$3n + 1$ oe	W2cao	SC1 for $jn + 1$ or $3n + k$ where j and k are integers. $j \neq 0$
(ii)	$2n + 2$ oe	W2cao	SC1 for $jn + 2$ or $2n + k$ where j and k are integers. $j \neq 0$
(d)	$n - 1$ or $1 - n$	W2ft	M1 for ' $(3n + 1)$ ' – ' $(2n + 2)$ ' or reversed Ft and M1 dependent on two linear algebraic expressions