

**MARK SCHEME for the October/November 2010 question paper
for the guidance of teachers**

0581 MATHEMATICS

0581/32

Paper 3 (Core), maximum raw mark 104

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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
- art anything rounding to
- soi seen or implied

Qu.	Answers	Mark	Part Marks
1	(a) $0.76 \times 1000 = 760$ oe	2	B1 0.76×1000 or $1000 - 0.24 \times 1000$
	(b) $\frac{19}{25}$ cao	2	B1 for $\frac{760}{1000}$ or $\frac{76}{100}$ or $\frac{38}{50}$
	(c) 120	2	M1 for $6 \times 760 \div (6 + 15 + 17)$ or $6 \div (6 + 15 + 17)$ or $760 \div (6 + 15 + 17)$ or 20
	(d) 23 or art 23.1	3	M1 for $80 - 65 (= 15)$ and M1 dep for '15' $\div 65 \times 100$
2	(a) (i) 2 and 45 or 3 and 30 or 5 and 18 or 6 and 15 or 9 and 10	1	B1 for each correct prime factor –1 for 1 or more non prime factors of 90 given in addition And –1 once if any non factors of 90 are given
	(ii) 2, 3, and 5 (ignore 1 if included)	3	
	(b) (i) 15 or 19	1	
	(ii) 984	1	
	(iii) 81	1	
	(iv) 8 or 1	1	
	(v) 91	1	
	(vi) 4	1	
(vii) 109	1		

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3	<p>(a) (i) 15 50 cao (ii) 1.6 (km) cao (iii) 14 (mins) cao (iv) art 6.86 (km/h)</p> <p>(b) (i) (16 04, 4) to (16 10, 4) ('16 10', 4) to ('16 50', 0)</p> <p>(ii) 16 50</p> <p>(c) (i) Straight line from 15 48 to 16 34 (ii) 16</p>	<p>1 1 1 3ft</p> <p>1 2ft</p> <p>1ft</p> <p>2 1ft</p>	<p>M1 for '1.6' ÷ '14' and M1ind for '14' ÷ 60 soi</p> <p>Line must be horizontal M1 for dealing with the time 4 ÷ 6 × 60 ft for a time period of 40 minutes only ft their time at home</p> <p>B1 for one end correct or both correct and line missing or not straight ft their time difference on <i>x</i>-axis</p>
4	<p>(a) (i) Perpendicular bisector of <i>BC</i> with 2 pairs of arcs (ii) <i>S</i> at midpoint of <i>BC</i> (iii) Bisector of angle <i>ABC</i> with two pairs of arcs (iv) <i>R</i> clearly marked (v) <i>Q</i> marked on <i>BA</i> (vi) <i>BQRS</i> drawn</p> <p>(b) 829 to 974 cao (if their <i>BQRS</i> is approximately a square)</p> <p>(c) Line from <i>A</i> at 070° Line from <i>C</i> at 345°</p> <p>(d) Circle radius 4 cm centre their <i>T</i></p>	<p>2</p> <p>1</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p> <p>3</p> <p>1</p> <p>1</p> <p>2ft</p>	<p>B1 correct without arcs</p> <p>Independent</p> <p>B1 correct without arcs</p> <p>ft their (a)(i) and (a)(iii)</p> <p>ft their marked <i>R</i> and their marked <i>S</i></p> <p>ft their <i>Q</i>, <i>R</i> and <i>S</i></p> <p>For square or rectangle M2 their length × their width × 36 or M1 for their length or width to metres or M1ind for their length × their width</p> <p>SC1 for any circle centre their <i>T</i> or SC1 for any circle radius 4 cm</p>
5	<p>(a) (i) (2, 6) and (−3, −4) (ii) (<i>n</i> =) 12 cao</p> <p>(b) (i) 2 cao (ii) Lines of symmetry drawn (iii) <i>y</i> = <i>x</i> oe and <i>y</i> = −<i>x</i> oe cao</p> <p>(c) (i) (<i>x</i> =) 3.3 to 3.7 and (<i>x</i> =) −3.3 to −3.7 (ii) Line parallel to line in (c)(i) through (0, 4) (iii) <i>y</i> = <i>x</i> + 4 oe</p>	<p>2</p> <p>1</p> <p>1</p> <p>1, 1</p> <p>1, 1</p> <p>1ft</p> <p>1ft</p> <p>1ft</p> <p>2ft</p>	<p>B1 for one pair correct</p> <p>ft their graph</p> <p>(c)(i) line must be linear</p> <p>B1 for <i>y</i> = <i>mx</i> + 4 (<i>m</i> ≠ 0) or for <i>y</i> = <i>x</i> + <i>k</i> (<i>k</i> ≠ 0) B1ft for <i>y</i> = <i>mx</i> + '4' (<i>m</i> ≠ 0) or for <i>y</i> = '<i>m</i>'<i>x</i> + <i>k</i> (<i>k</i> ≠ 0)</p>

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6	(a) (i) 140 (ii) $180n - 360$ (iii) 15	2 1 3	M1 for $180 \times (9 - 2) \div 9$ or better M2 for $360 \div (180 - 156)$ or M1 for $156n =$ their (a)(ii) and M1dep for $pn = q$ from their linear expression
	(b) $(x =) -2, (y =) 3$	3	M1 for equating coefficients of x or y and adding or subtracting, allow 1 error A1 for 1 correct
7	(a) Trapezium	1	
	(b) 68.2	3	M2 for $\tan = 50 \div (85 - 65)$ or better B1 for $85 - 65 (= 20)$ seen in working area
	(c) 3750	2	M1 for $0.5(65 + 85) \times 50$
	(d) 360 000 cm ³	1ft 1	ft their (c) $\times 96$, correct to a minimum of 3sf units mark independent
8	(a) (i) $150 \div 360 \times 24 (= 10)$	2	M1 for their '150' $\div 360 \times 24$ or B1 for 150
	(ii) (lost) 8, (drawn) 6	3	B1 for 120 or 90 seen and M1 for '120' $\div 360 \times 24$ or '90' $\div 360 \times 24$
	(b) (i) 5, 7, 6, 3, 2, 1	2	B1 for 5 correct or 4 correct with total 24 or SC1 if only tallies seen (all must be correct)
	(ii) 1	1ft	ft their table
	(iii) 1.5	2	M1 for evidence of attempt at middle value
(iv) 1.7 or 1.71 or 1.70(8...) cao	3	M1 for $0 \times '5' + 1 \times '7' + 2 \times '6' + 3 \times '3' + 4 \times '2' + 5 \times '1'$ and M1dep division by 24	
9	(a) (i) 3.82 art	2	M1 for $2.7^2 + 2.7^2$ or better or $\sin 45 = \frac{27}{BD}$ or better or $\cos 45 = \frac{27}{BD}$ or better
	(ii) Isosceles	1	
	(iii) 45 cao	1	
	(b) (i) Diagram 4	1	
	(ii) 10, 13, 16	2	B1 for 2 correct or difference of 3 seen between diagram 4 and diagram 5 in table
	(c) (i) 28	1	
	(ii) $3n + 1$ oe	2	B1 for $pn + 1 (p \neq 0)$ or $3n + q$
	(d) 25	2ft	M1 for $76 =$ their (c)(ii) (if linear)
(e) $3n + 2$ oe	1ft	ft their (c)(ii) $+ 1$ (must be a linear expression)	