

**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
International General Certificate of Secondary Education

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

**0580 MATHEMATICS**

**0580/32**

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
<b>1</b>	<b>(a)</b> $0.76 \times 1000 = 760$ oe	2	<b>B1</b> $0.76 \times 1000$ or $1000 - 0.24 \times 1000$
	<b>(b)</b> $\frac{19}{25}$ cao	2	<b>B1</b> for $\frac{760}{1000}$ or $\frac{76}{100}$ or $\frac{38}{50}$
	<b>(c)</b> 120	2	<b>M1</b> for $6 \times 760 \div (6 + 15 + 17)$ or $6 \div (6 + 15 + 17)$ or $760 \div (6 + 15 + 17)$ or 20
	<b>(d)</b> 23 or art 23.1	3	<b>M1</b> for $80 - 65 (= 15)$ and <b>M1</b> dep for '15' $\div 65 \times 100$
<b>2</b>	<b>(a) (i)</b> 2 and 45 or 3 and 30 or 5 and 18 or 6 and 15 or 9 and 10	1	<b>B1</b> 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
	<b>(ii)</b> 2, 3, and 5 (ignore 1 if included)	3	
	<b>(b) (i)</b> 15 or 19	1	
	<b>(ii)</b> 984	1	
	<b>(iii)</b> 81	1	
	<b>(iv)</b> 8 or 1	1	
	<b>(v)</b> 91	1	
	<b>(vi)</b> 4	1	
<b>(vii)</b> 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</p> <p>(ii) 16</p>	<p>1  1  1  3ft</p> <p>1  2ft</p> <p>1ft</p> <p>2  1ft</p>	<p><b>M1</b> for '1.6' ÷ '14'  and <b>M1ind</b> for '14' ÷ 60 soi</p> <p>Line must be horizontal  <b>M1</b> for dealing with the time 4 ÷ 6 × 60  ft for a time period of 40 minutes only  ft their time at home</p> <p><b>B1</b> 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  1  2  1  1  1</p> <p>3</p> <p>1  1</p> <p>2ft</p>	<p><b>B1</b> correct without arcs</p> <p>Independent</p> <p><b>B1</b> 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  <b>M2</b> their length × their width × 36  or <b>M1</b> for their length or width to metres  or <b>M1ind</b> for their length × their width</p> <p><b>SC1</b> for any circle centre their <i>T</i>  or  <b>SC1</b> 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) <math>y = x</math> oe and <math>y = -x</math> oe cao</p> <p>(c) (i) (<math>x =</math>) 3.3 to 3.7 and  (<math>x =</math>) −3.3 to −3.7  (ii) Line parallel to line in (c)(i)  through (0, 4)  (iii) <math>y = x + 4</math> oe</p>	<p>2  1</p> <p>1  1, 1  1, 1</p> <p>1ft  1ft  1ft</p> <p>2ft</p>	<p><b>B1</b> for one pair correct</p> <p>ft their graph</p> <p>(c)(i) line must be linear</p> <p><b>B1</b> for <math>y = mx + 4</math> (<math>m \neq 0</math>) or for <math>y = x + k</math> (<math>k \neq 0</math>)  <b>B1ft</b> for <math>y = mx + '4'</math> (<math>m \neq 0</math>) or for <math>y = 'm'x + k</math>  (<math>k \neq 0</math>)</p>

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6	(a) (i) 140 (ii) $180n - 360$ (iii) 15	2 1 3	<b>M1</b> for $180 \times (9 - 2) \div 9$ or better  <b>M2</b> for $360 \div (180 - 156)$ or <b>M1</b> for $156n =$ their (a)(ii) and <b>M1dep</b> for $pn = q$ from their linear expression
	(b) $(x =) -2, (y =) 3$	3	<b>M1</b> for equating coefficients of $x$ or $y$ and adding or subtracting, allow 1 error <b>A1</b> for 1 correct
7	(a) Trapezium	1	
	(b) 68.2	3	<b>M2</b> for $\tan = 50 \div (85 - 65)$ or better <b>B1</b> for $85 - 65 (= 20)$ seen in working area
	(c) 3750	2	<b>M1</b> for $0.5(65 + 85) \times 50$
	(d) 360 000 cm <sup>3</sup>	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	<b>M1</b> for their '150' $\div 360 \times 24$ or <b>B1</b> for 150
	(ii) (lost) 8, (drawn) 6	3	<b>B1</b> for 120 or 90 seen and <b>M1</b> for '120' $\div 360 \times 24$ or '90' $\div 360 \times 24$
	(b) (i) 5, 7, 6, 3, 2, 1	2	<b>B1</b> for 5 correct or 4 correct with total 24 or <b>SC1</b> if only tallies seen (all must be correct)
	(ii) 1	1ft	ft their table
	(iii) 1.5	2	<b>M1</b> for evidence of attempt at middle value
	(iv) 1.7 or 1.71 or 1.70(8...) cao	3	<b>M1</b> for $0 \times '5' + 1 \times '7' + 2 \times '6' + 3 \times '3' + 4 \times '2' + 5 \times '1'$ and <b>M1dep</b> division by 24
9	(a) (i) 3.82 art	2	<b>M1</b> 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	<b>B1</b> 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	<b>B1</b> for $pn + 1 (p \neq 0)$ or $3n + q$
	(d) 25	2ft	<b>M1</b> for $76 =$ their (c)(ii) (if linear)
	(e) $3n + 2$ oe	1ft	ft their (c)(ii) $+ 1$ (must be a linear expression)