

**MARK SCHEME for the May/June 2011 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

Qu.	Answers	Mark	Part Marks
1	(a) (i) $3000 \div (4 + 7 + 8 + 5)$ and multiply by 7	2	<b>M2</b> for $\frac{7}{24} \times 3000$  <b>M1</b> for $3000 \div (24 \text{ or their clear attempt at total})$
	(ii) 500 www cao	2	<b>M1</b> for $4 \div \text{their } 24 \times 3000 \text{ oe}$ or $\frac{4}{7} \times 875$
	(b) $\frac{1}{3}$	2	<b>B1</b> for $\frac{8}{24}$ or $\frac{4}{12}$ or $\frac{2}{6}$ oe seen or <b>SC1</b> $\frac{2}{5}$
	(c) 560	2	<b>M1</b> for $64 \div 100 \times 875$ or $0.64 \times 875$ oe
	(d) 23.5 or 23.52 to 23.53	3	<b>W1</b> for $105 - 85$ implied by 20  <b>M1dep</b> for their $(105 - 85) \div 85 \times 100$
	(e) 5660	3	<b>B2</b> for 5660.48 or 5660.5 or 660  If <b>B0</b> then <b>M1</b> for $5000 \times (1 + \frac{6.4}{100}) \times (1 + \frac{6.4}{100})$ or better
2	(a) (i) Enlargement (Scale factor) $-\frac{1}{2}$ (centre) origin oe	1 1 1	Independent marks
	(ii) 12	2	<b>M1</b> for $0.5 \times 6 \times 4$ or <b>SC1</b> for $-12$
	(iii) 15.7 to 16.5(cm)	1	
	(b) Image (0, -2), (-6, -2) and (-4, -6)	1	
	(c) Image (2, 0), (2, 6) and (6, 4)	2	<b>SC1</b> rotation $90^\circ$ anti-clockwise or $90^\circ$ clockwise about any other point
	(d) Reflection  $y = -x$ oe	1  1	Independent marks if no equation given then accept correct line drawn on diagram

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<b>3 (a)</b>	Scale shown on axis in 2s or 4s or 5s Bars correct for their linear scale	<b>1</b> <b>2ft</b>	<b>B1</b> for 3 bars correct or <b>B1</b> for 4 correct tops only shown, <b>B0</b> for line graph allow consistent gaps between bars
<b>(b)</b>	Silver	<b>1</b>	
<b>4 (a) (i)</b>	(\$) $57.5(0)$	<b>2</b>	<b>M1</b> for $12 + 6.5 \times 7$
<b>(ii)</b>	$12 + 6.5(0) n$ oe	<b>1</b>	
<b>(iii)</b>	5	<b>2ft</b>	<b>M1</b> for $(44.5(0) - \text{their } 12) \div \text{their } 6.5$ soi
<b>(b)</b>	$(x =) 5, (y =) -7$	<b>3</b>	ww both correct <b>B3</b> ww one correct <b>B0</b> <b>M1</b> for consistent multiplication and add/subtract or by substitution <b>M1</b> for $5x + 3(3x - 22) = 4$ oe <b>A1</b> for 1 correct answer
<b>5 (a)</b>	Triangle, Pentagon, Octagon	<b>1,1,1</b>	In correct position in the table
<b>(b) (i)</b>	$(x =) 40$	<b>2</b>	<b>M1</b> for $360 \div 9$ or complete long method
<b>(ii)</b>	140	<b>1ft</b>	ft $180 - (b)(i)$
<b>6 (a) (i)</b>	1700	<b>1</b>	
<b>(ii)</b>	1858(.3...) or 1860	<b>2</b>	<b>M1</b> for attempt at sum divided by 12 or <b>SC1</b> for 20558.3
<b>(iii)</b>	1750	<b>2</b>	<b>M1</b> for clear attempt to find the middle
<b>(b) (i)</b>	(Strawberry) 120 (Vanilla) 100	<b>3</b>	<b>B2</b> if only one is correct <b>B1</b> for Strawberry + Vanilla = 220 and/or <b>M1</b> for (Strawberry) $3600 \div (4200 + 3600 + 3000) \times 360$ or $140 \div 4200 \times 3600$ or better or (Vanilla) $3000 \div (4200 + 3600 + 3000) \times 360$ or $140 \div 4200 \times 3000$ or better
<b>(ii)</b>	Angles correct Labelling with names	<b>1ft</b> <b>1ft</b>	Independent. Consistent with angles in their table.
<b>(c) (i)</b>	5 points correctly plotted	<b>2</b>	<b>B1</b> for 3 or 4 correct
<b>(ii)</b>	Positive	<b>1</b>	
<b>(iii)</b>	Hotter weather more sales	<b>1</b>	Or any equivalent statement

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7	<p>(a) (i) <math>-1, -3, 3</math></p> <p>(ii) 8 points correctly plotted Smooth curve</p> <p>(iii) <math>(x =) -2.4</math> to <math>-2.2</math> cao and <math>1.2</math> to <math>1.4</math> cao</p> <p>(b) (i) <math>x = -\frac{1}{2}</math> drawn</p> <p>(ii) <math>x = -\frac{1}{2}</math> oe cao</p> <p>(c) (i) Ruled line through <math>A</math> and <math>B</math></p> <p>(ii) <math>(-2, -1)</math> and <math>(3, 9)</math> cao</p> <p>(iii) 2</p> <p>(iv) <math>(y =) 2x + 3</math> oe</p>	<p>2</p> <p>3ft</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1,1</p> <p>2</p> <p>2ft</p>	<p><b>B1</b> for any 2 correct</p> <p><b>B2</b> for 6 or 7 correctly plotted <b>B1</b> for 4 or 5 correctly plotted Must be close to parabolic in shape</p> <p>Accept dotted/dashed as intention clear</p> <p><b>M1</b> for numbers representing “Change in <math>y</math>/ Change in <math>x</math>”, implied by <math>\frac{2k}{k}</math></p> <p><b>B1</b> <math>y =</math> their (c)(iii) <math>x + k</math> or <math>y = mx + 3</math> (<math>k, m \neq 0</math>)</p>
8	<p><b>All ft in this question are strict follow through</b></p> <p>(a) (i) <math>(0)55^\circ</math></p> <p>(ii) 6 (km/h)</p> <p>(b) Line on bearing <math>145^\circ</math> <math>(BC =) 7</math> cm</p> <p>(c) (i) <b>strict follow through</b></p> <p>(ii) <b>strict follow through</b></p> <p>(iii) <b>strict follow through</b></p> <p>(d) (i) Circle (or long enough arc) centre <math>A</math>, radius 4 cm Circle (or long enough arc) centre <math>B</math>, radius 3 cm</p> <p>(ii) <b>strict follow through</b> Must be one buoy on each side of <math>AB</math>.</p> <p>(iii) <b>strict follow through</b></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1ft</p> <p>1ft</p> <p>1ft</p> <p>2</p> <p>1ft</p> <p>1ft</p>	<p>Independent marks</p> <p>Follow through their <math>CA</math></p> <p>Follow through their (c)(i) <math>\times 0.5</math></p> <p>Follow through their angle</p> <p><b>W1</b> for 1 correct circle (or long enough arc)</p> <p>Dependent on clear points for the buoys, even if not labelled <math>P</math> and <math>Q</math>.</p> <p>Their (d)(ii) <math>\div 2</math></p>

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<b>9</b>	<b>(a) (i)</b>	4968 Allow 4970	<b>2</b>	<b>M1</b> for $4 \times 60 \times 18 + 2 \times 18 \times 18$ oe
	<b>(ii)</b>	19440 Allow 19400	<b>2</b>	<b>M1</b> for $18 \times 18 \times 60$
	<b>(b) (i)</b>	15260 to 15271 or 15300	<b>2</b>	<b>M1</b> for $\pi \times 9 \times 9 \times 60$ or $4860\pi$ If <b>M0, SC1</b> for answer of 61000 to 61100
	<b>(ii)</b>	4172 or 4170 or 4169 to 4180 or 4140 or 4129 to 4140 or 4100	<b>1ft</b>	ft their <b>(a)(ii)</b> – their <b>(b)(i)</b> provided <b>(a)(ii)</b> > <b>(b)(i)</b>
	<b>(iii)</b>	3391 to 3393.5 or 3390	<b>2</b>	<b>M1</b> for $2 \times \pi \times 9 \times 60$ or $1080\pi$ If <b>M0, SC1</b> for answer of 6780 to 6790
<b>10</b>	<b>(a) (i)</b>	43 36	<b>1</b>	
	<b>(ii)</b>	-1 3	<b>1, 1ft</b>	ft 4 more than 5 <sup>th</sup> term
	<b>(b)</b>	-27	<b>1</b>	
	<b>(c)</b>	$4n - 21$ oe	<b>2</b>	<b>B1</b> for $4n + k$ or $jn - 21$ where $j$ and $k$ are positive or negative integers and $j \neq 0$ .
	<b>(d) (i)</b>	$(n =) 9$	<b>2cao</b>	<b>M1</b> for $78 - 7n =$ their <b>(c)</b> if linear.
	<b>(ii)</b>	15	<b>2cao</b>	<b>M1</b> for $78 - 7 \times$ their <b>(d)(i)</b> or substituting their <b>(d)(i)</b> into their <b>(c)</b>