

**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	M2 for $\frac{7}{24} \times 3000$ M1 for $3000 \div (24 \text{ or their clear attempt at total})$
	(ii) 500 www cao	2	M1 for $4 \div \text{their } 24 \times 3000 \text{ oe}$ or $\frac{4}{7} \times 875$
	(b) $\frac{1}{3}$	2	B1 for $\frac{8}{24}$ or $\frac{4}{12}$ or $\frac{2}{6}$ oe seen or SC1 $\frac{2}{5}$
	(c) 560	2	M1 for $64 \div 100 \times 875$ or 0.64×875 oe
	(d) 23.5 or 23.52 to 23.53	3	W1 for $105 - 85$ implied by 20 M1dep for their $(105 - 85) \div 85 \times 100$
	(e) 5660	3	B2 for 5660.48 or 5660.5 or 660 If B0 then M1 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	M1 for $0.5 \times 6 \times 4$ or SC1 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	SC1 rotation 90° anti-clockwise or 90° 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

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

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

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