

**MARK SCHEME for the May/June 2012 question paper
for the guidance of teachers**

0580 MATHEMATICS

0580/33

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
- soi seen or implied

Qu.	Answers	Mark	Part Mark
1	(a) (i) -4	1	allow -8
	(ii) -4 -3 -1 2 5	1	
	(iii) 8	1	
	(b) (i) 1305	1	
	(ii) 3 (h) 35 (m) cao	1	
	(c) 488 km/h	1 1	
2	(a) 1, 2, 4, 7, 14, 28	2	1 for four or five correct or 1×28 and 2×14 and 4×7 M1 for a method to achieve this such as prime factors, $8 = 2^3$ and $14 = 2 \times 7$ or another multiple of 56, or two trials accept 8 56 (am) B1 for either $84a$ or $36c$
	(b) 24	1	
	(c) 5832	1	
	(d) (p =) 2 (q =) 5	1 1	
	(e) (i) 56	2	
	(ii) 08 56	1ft	
	(iii) $84a + 36c$ final answer	2	

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3	(a)	quadrilateral	1	
	(b)	obtuse	1	
	(c)	23.6–24.4	2	M1 for 11.8 – 12.2
	(d)	31–35	1	
	(e)	construction of perpendicular bisector of EH part circle centre H radius 7 cm indication of region	5	B1 for two pairs of arcs, same radius, centres E and H B1 for bisector within 2mm of correct one, $\pm 2^\circ$ of correct angle B1 for part circle centre H B1 for radius 7 cm B1ft for an indication of the region, ft dependent on at least B2 from above
	(f)	6135.36 or 6135.4 or 6135 or 6140	2	M1 for $33.2 \times 16.8 \times 11$
4	(a)	107.52	3	M1 $2 \times 24 + 3 \times 16$ or 96 M1 for their 96×1.12 oe
	(b)	28.8(0)	2	M1 for $24 \times 1.2(0)$ oe
	(c)	14	3	B1 for 42(c) or (\$ 0).42 M1 for their $\frac{42}{300}$ oe ($\times 100$) or $\frac{0.42}{3}$ ($\times 100$) alt. method : M1 $\frac{3.42}{3}$ ($\times 100$) or $\frac{342}{300}$ ($\times 100$) M1 their 114 – 100
5	(a)	two correct ruled lines	1,1	SC1 correct but freehand or fully correct with one extra line
	(b)	correct square shaded	1	
	(c)	correct enlargement	2	1 for a correct side
	(d) (i)	1, –5	1	
	(ii)	correct reflection	1	
	(iii)	correct translation	2	B1 for either direction e.g. 1 to the right or 3 down SC1 for complete correct 3 left and 1 up triangle
(iv)	rotation, (centre) (0,0) angle 180	3	1 for rotation, 1 for (centre) (0,0), 1 for angle 180	

6	(a)	3 : 4 cao	1	
	(b)	168	2	M1 $420 \div (2 + 3)$ or 84 seen
	(c)	$300 \div 20 = 15$	2	if 0 scored SC1 for $\frac{250 / 260 / 270 / 300}{20 / 23 / 25}$ or 15 ww
	(d)	68.5(2)	2	M1 for 46.3×1.48 , 68.53 or 68.524
	(e) (i)	64.5	1	
	(ii)	1805	1	
7	(a)	four points correctly plotted	2	M1 for three points correctly plotted
	(b)	positive	1	ignore extras like 'strong'
	(c) (i)	54.8	2	M1 for their sum $(548) \div 10$
	(ii)	46	1	
	(iii)	A and it has a lower mean	1ft	allow any correct reason using appropriate information from the table and ft their mean
	(d) (i)	correct ruled line	1	at A = 40 allow 44–48 at A = 70 allow 70–78
(ii)	correct reading from their line	1ft	read from their ruled line	
(e)	3	1ft		
8	(a)	(20) 13 (8) 5 4 5 (8) 13 (20)	3	B2 for 4 correct B1 for 2 or 3 correct or a correct substitution seen
	(b)	correctly plotting 9 points and connecting with a smooth curved line	4	P3 for correctly plotting 9 points, P2 for correctly plotting 7 or 8 points and P1 for 5 or 6 points C1 for a smooth curve
	(c) (i)	correct line of symmetry cao	1	
	(ii)	$x = 1$	1ft	ft their line
	(d) (i)	correct line	1	
	(ii)	-1.9 to -1.7 and 3.7 to 3.9	1ft,1ft	SC1 for correct co-ordinates
	(e) (i)	-3 cao	1	
	(ii)	(0,6) cao	1	
(iii)	$y = c - 3x$	1	c can be any number except 6	
(f)	$12x - 9$ or $3(4x - 3)$	2	B1 for $6x + 3$, $-12 + 6x$, $12x$ or -9	

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9	(a) (i)	60	1	
	(ii)	30	1ft	ft their (i) ÷ 2
	(b)	8 (cm)	1	
	(c)	$\cos 30 = \frac{x}{8}$ or $8^2 = x^2 + 4^2$ 6.928.....	M1ft	ft their angle <i>AOM</i> or <i>AB</i>
	(d)	27.7(2) cao	A1	
	(e)	34.7–34.9	2	M1 $\frac{1}{2} \times$ their (b) \times 6.93 soi
			4	M1 (circle) = $\pi \times 8^2$ soi M1 (hexagon) = $6 \times$ their (d) soi M1dep their circle – their hexagon
10	(a)	correct pattern	1	
	(b) (i)	22	1	
	(ii)	add 4	1	must have 4 with a direction, accept plus 4
	(c)	$4n + 2$ or $4(n - 1) + 6$ oe	2	B1 for $4n + j$ or $kn + 2$ ($k \neq 0$) seen
	(d)	15 cao	2	M1 their (c) = 62 or multiple additions or subtractions