

Notes	Mark Scheme	Syllabus
	IGCSE EXAMINATIONS – JUNE 2003	0580/0581

TYPES OF MARK

Most of the marks (those without prefixes, and 'B' marks) are given for accurate results, drawings or statements.

- **M** marks are given for a correct method.
- **B** marks are given for a correct statement or step.
- **A** marks are given for an accurate answer following a correct method.

ABBREVIATIONS

a.r.t.	Anything rounding to
b.o.d.	Benefit of the doubt has been given to the candidate
c.a.o.	Correct answer only (i.e. no 'follow through')
e.e.o.	Each error or omission
o.e.	Or equivalent
SC	Special case
s.o.i.	Seen or implied
ww	Without working
www	Without wrong working
✓	Work followed through after an error: no further error made
✗	Work followed through and another error found

CAMBRIDGE
INTERNATIONAL EXAMINATIONS

June 2003

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 56

SYLLABUS/COMPONENT: 0580/01, 0581/01

MATHEMATICS

Paper 1 (Core)



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* indicates that it is necessary to look in the working following a wrong answer.

1	(a) 19.55249(345) (b) 19.55	1 1 ✓	
2	(a) 3.3 to 3.7 (b) - 0.9	1 1 ✓	Allow negative values 2.6 - I(a)
3	(a) $\frac{33}{50}$ 67% 0.68 (b) $\frac{17}{25}$	1 1	Allow 0.66, 0.67, 0.68 o.e.
4	42	2*	M1 72 ÷ 12
5	781000	2*	M1 for 550 000 x 1.42
6	366	2*	M1 for "97.60" x 3.75
7	$\frac{4}{9}$	2*	M1 for $\frac{9}{4}$ or 0.44....., $2\frac{1}{4}$, $\frac{2}{3}$, $\frac{2}{3}^2$
8	(a) - 30 c.a.o. (b) $\sqrt{4u - 3}$	1 1	c.a.o.
9	$\frac{1}{2}$	3*	M1 6 - 3x M1 $x + 3x = 6 - 4$
10	(a) 0.004 (b) 4×10^{-3}	2* 1 ✓	M1 figs 2 : 500000 or figs 4 in answer
11	a = 3, b = -1	3*	M1 adding or x 2 nd equation by 3 and subtracting A1 A1 o.e. (Rearrange and substitute scores M1) Working essential if only one answer is correct
12	(a) 88 c.a.o. (b) 85.5, 86.5	1 1, 1	Not 88.0 B1 both correct and reversed
13	(a) 20 05 (b) (i) 0.4 (ii) 24	1 2* 1 ✓	Allow 20:05, 8.05pm. Not 20.5 or 20h5m M1 30 ÷ 75 (i) × 60

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14	(a) $\frac{3+4}{6} = \frac{7}{6}$	2*	M1 for first term o.e.
	(b) $\frac{6}{5} \times \frac{7}{4} = \frac{21}{10}$	2*	M1 for improper fractions
15	(a) (i) 28	2*	M1 for $\frac{1}{2} \times 8 \times 7$
	(ii) 176	2√	M1 for $4 \times (i) + 8^2$ A1√
	(b) pyramid	1	
16	(a) 90	1	
	(b) 7.71	2*	M1 $\sin 40 = PB/12$ or $\frac{12}{\sin(a)} = \frac{PB}{\sin 40}$
	(c) 113	2*	M1 $\pi \times 6^2$
17	(a) 9.59	2*	M1 $8.3^2 + 4.8^2$
	(b) 210	3*	M1 $\tan x = \frac{4.8}{8.3}$ M1 $180 + x$ at P If sin or cos used then allow √ from (a). NO marks for scale drawing
18	(a) (i) 35	1	
	(ii) 25	1√	60 – (i)
	(b) similar	1	
	(c) 11(.0)	2*	M1 $\frac{16.6}{8.3} = \frac{CX}{5.5}$ o.e. Not 11.1 or M1 for $\frac{16.6}{\sin 120} = \frac{CX}{\sin 35}$
TOTAL		56	

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MARK SCHEME
MAXIMUM MARK: 70
SYLLABUS/COMPONENT: 0580/02, 0581/02 MATHEMATICS Paper 2 (Extended)

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Question Number	Mark Scheme	Part Marks	Notes	Question Total
1	$0.049 < 5\% < 5/98$ o.e.	2	M1 for <i>figs</i> 51... seen after 0, SC1 for 2 correct entries	2
2 (a)	7.85 to 8(.00...)	1		2
(b)	56.25 to 57.5(0)	1		
3	194(.4)	2	M1 for $54 \times 3600/1000$ or SC1 for <i>figs</i> 194....seen	2
4	$\begin{pmatrix} -4 \\ -7 \end{pmatrix}$ c.a.o.	1 1		2
5	38	2	M1 for $665/(17 + 18)$ s.o.i. by equivalent complete method	2
6	201.25	2	allow 201 or 201.3 in ans. space if 201.25 seen M1 for 17.5×11.5 s.o.i.	2
7	$4 < x < 6$	2	SC1 for either one after 0, M1 for $8 < 2x < 12$ s.o.i.	2
8	$\begin{matrix} \pm 11 & - & \pm 1331 \\ 14 & 196 & - \\ -7 & 49 & - \end{matrix}$	3	2 for 4 or 5 correct 1 for 2 or 3 correct	3
				17
9 (a)	$\frac{1}{6}$ or 0.16(.....) or 0.17	1		3
(b)	art 9.5(°)	2	M1 for correct use of tan o.e.	
10	$\frac{x+11}{(x-3)(x+4)}$ o.e.	3	M1 for denom. $(x-3)(x+4)$ o.e. M1 for $2(x+4) - (x-3)$ o.e.	3
11	integer $\sqrt{(112/7)}$ rational nos. 2.6 4/17 irrational no. $\sqrt{12}$	1 1 1 1	accept $\sqrt{16}$ or 4 accept 0.235 accept 3.46	4
12 (a)	18	2	M1 for $2p + 3p + 90 = 180$ o.e. or SC1 for 36 or 54 seen www.	4
(b)	30	2	M1 for $q + 5q = 180$ o.e. or SC1 for 150 seen	
				14

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13 (a)	100	1		
(b)	$1200 \sqrt{\quad}$	1	$\sqrt{\quad}$ for $(12 \times \text{their } a)$	
(c)	$10 < x < 30$ ht 30 mm $60 < x < 100$ ht 22 mm	1 1		4
14 (a)	$\begin{matrix} 10 & 17 & 4 \\ -6 & -9 & 0 \end{matrix}$	2	SC1 if 4 or 5 correct	
(b)	$\frac{1}{2} \begin{pmatrix} -2 & -4 \\ 3 & 5 \end{pmatrix} \text{oe}$	2	1 for $\frac{1}{2}$ s.o.i., 1 for $k \begin{pmatrix} -2 & -4 \\ 3 & 5 \end{pmatrix}$ s.o.i.	4
15 (a)	50.3	2	M1 for $\frac{(7087000 - 4714900)}{4714900}$ o.e. must be recognisable complete correct method	
(b) (i)	4710000 or 4.71×10^6	1		
(ii)	7.087×10^6	1	accept 7.09×10^6 , ignore superfluous zeros	4
16 (a)	24.7	2	M1 for $80 \times \sin 18^\circ$ seen	
(b)	46.2	2	M1 for $3(4 + 11.4)$ o.e. (no MRs) 3×3.8 does not imply 11.4	4
				16
17 (a)	Correct shear $\pm 1\text{mm}$	2	M1 for shear with either axis invariant	
(b) (i)	Correct stretch $\pm 1\text{mm}$	2	M1 for stretch with either axis invariant	
(ii)	$\begin{pmatrix} 1 & 0 \\ 0 & 3 \end{pmatrix} \text{cao}$	1		5
18 (a)	1:1000	1		
(b) (i)	accurate perp bisector of AD, with two pairs of arcs	2	SC1 if accurate but no arcs SC1 if accurate arcs but no line	
(ii)	accurate bisector of $\angle BCD$, with two pairs of arcs T marked in correct position	2 1	SC1 if accurate but no arcs SC1 if accurate arcs but no line Indep.	6
				11

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19 (a)	correct demonstration	2	M1 for $20x + 80y$ seen	
(b)	$x + 2y = 120$ o.e. fully simplified	2	M1 for $25x + 50y = 3000$ seen condone inequality signs for method mark. Ignore \$	
(c)	straight line thr. (120,0) and (0,60) 60 cars, 30 trucks	1√ 1	√ from <i>their b</i> . Line must be complete, and be on given grid also allow 80,20; 100,10; 120,0 or points on the correct section of the line ($60 \leq x \leq 120$)	6
				6
20 (a)	art 0.1, 0.3, 0.6, 1, 1.7 and 3	3	SC2 for 4 or 5 correct SC1 for 2 or 3 correct	
(b)	correct curve drawn	2	P1 for correct or √ 6 or 7 points correctly plotted $\pm 1\text{mm}$	
(c)	$1.6 \leq x < 1.65$	1		6
				6

TOTAL MARKS 70

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MARK SCHEME

MAXIMUM MARK: 104

SYLLABUS/COMPONENT: 0580/03, 0581/03

MATHEMATICS

Paper 3 (Core)



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1	(a)	7	1	
	(b)	42	1	
	(c) (i)	9	1	
	(ii)	8	2	M1 for evidence of idea of mid-value
	(iii)	8.3	3	M1 for $4 \times 5 + 7 \times 6 + \dots + 3 \times 12$ or 415 M1 (dep) for $\div 50$
	(d)	5cm	2	M1 for 1cm to 2 students o.e.
	(e)	36°	2	M1 for $\frac{5}{50} \times 360$
	(f)	\$7.5(0)	2	M1 $\div 3$
	(g)	22	2	M1 for $\frac{11}{50} (x 100)$ SC1 for $\frac{19}{50} (x 100) = 38\%$
	(h) (i)	$\frac{6}{50}$	1	} Accept equivalent fractions, decimals or percentages
	(ii)	$\frac{14}{50}$	1	
	(iii)	1	1	
				19
2	(a)	120,24, 20	1, 1, 1	
	(b)	7 correctly plotted points f.t. correct curve	P3 C1	Deduct 1 for each error (± 1 mm) Must be a reasonable hyperbola
	(c)	1.6 to 1.8	1	Accept f.t.
	(d)	120,0	2	
	(e)	Straight line through 4 points	L2	L1 if short or not ruled SC1 for \surd if all straight lines
	(f)	(1.2 – 1.4, 92 – 96) (4.6 – 4.8, 24 – 26)	1 1	} Accept f.t.
	(g)	-20	2	SC1 for 20 <u>or</u> M1 for rise/run seen (numerical attempt)
				16

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3	(a) (i)	175 cents	1	
	(ii)	25 <i>b</i> cents	1	
	(iii)	\$1.75	1 or $\sqrt{}$	
	(iv)	$\$ \frac{b}{4}$ (allow $\frac{25b}{100}$) (0.25 <i>b</i>)	1 or $\sqrt{}$	If involves <i>b</i>
	(b) (i)	$\frac{T}{n}$	1	
	(ii)	The cost of one bar	1	
	(c) (i)	4.5(0)	1	
	(ii)	4.2(0)	2	M1 for (36 – 6.60)/7
	(iii)	$\frac{y}{x}$	1	
	(iv)	$\frac{y-7}{x-1}$	2	B1 for <i>y</i> – 7 or <i>x</i> – 1 seen
12				
4	(a) (i)	<i>P</i> with vertices (4, 11), (2, 11), (2, 12)	2	SC1 if translated by $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$, $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$ etc.
	(ii)	<i>Q</i> with vertices (9, 7), (11, 7), (11, 8)	2	SC1 if reflected in <i>y</i> = 8 or $\sqrt{}$ from <i>P</i>
	(iii)	<i>R</i> with vertices (7, 7), (7, 5), (6, 5)	2	SC1 if 90° clockwise from <i>A</i> or $\sqrt{}$ from <i>Q</i>
	(iv)	<i>S</i> with vertices (7, 7), (3, 7), (3, 9)	2	SC1 if different scale factor about <i>A</i> or enlargement of triangle <i>T</i> s.f. 2 about <i>B</i> or <i>C</i>
	(b) (i)	Translation $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$	1 1	
	(ii)	Enlargement Scale factor 1/2 centre <i>A</i>	1 1 1	
	(c) (i)	90° (anti-clockwise)	1	Accept 270° clockwise
	(ii)	(3, 3)	2	B1 for 1 correct
	16			

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5	(a) (i)	Accurate and with arcs	2	B1 without arcs or inaccurate
	(ii)	Accurate quarter-circle $r = 5$	2	SC1 for $r > 4.8$ or < 5.2 with compass or correct r but freehand
	(b)	Correct region shaded	1 or $\sqrt{\quad}$	If convinced
	(c) (i)	45° correct 12cm correct	1 1	$\pm 2^\circ$ $\pm 1\text{mm}$
	(ii)	Reasonable tangent	1	Must be ruled $\pm 5^\circ$
	(iii)	6.8 to 7.2	1	Accept f.t. ± 0.1
				9
6	(a)	$3 \times 1 \times 1.5 + 9 \times 1$ o.e.	2	M1 for appropriate strategy M1 (dep.) for correct numbers used
	(b)	3780	3	M1 for volume is area \times length, 13.5×2.8 or 37.8 B1 for 280 seen
	(c) (i)	1.92	2	M1 for $2 \times 1.2 \times 0.8$
	(ii)	1 920 000 f.t.	2	M1 for (their) (i) $\times 10^6$ or $200 \times 120 \times 80$
	(iii)	507 f.t.	2	M1 for (c) (ii) \div (b) or $507 \cdot \dots$ or 508
	(d)	One vertical line drawn	1	Within $\pm 0.2\text{cm}$ of the centre
	(e)	(order) 1 or no symmetry	1	
				13
7	(a) (i)	84°	1	
	(ii)	22°	1	
	(b)	11	1	Accept 10.8 \rightarrow 11, 10min 48sec \rightarrow 11min
	(c)	16°	1	
	(d) (i)	32, (16), 8, 4	3	B1 for each
	(ii)	Halving o.e.	1	
	(e)	20°	1	Allow answer >20 and <22
				9

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8	(a)	3 new lines from the vertex to the base	2	
	(b)	$6, 7, n + 2$	3	B1 for each
	(c)	15, 21, 55	3	B1 for each
	(d)	12	2	SC1 for 10 or 11
				10

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MARK SCHEME

MAXIMUM MARK: 130

SYLLABUS/COMPONENT: 0580/04, 0581/04

MATHEMATICS

Paper 4 (Extended)



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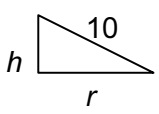
Marks in brackets are totals for questions or part questions.

1	(a)	(\$) 3490		B1 (1)	
	(b)	$16n + 1570 = 4018$ o.e. $n = 153$ c.a.o.		M1 A1 (2)	ww2
	(c)	$x + y = 319$ o.e. $10x + 16y = 3784$ o.e. Correct method s.o.i. $x = 220$ $y = 99$		B1 B1 M1 A1 A1 (5)	e.g. $1^{\text{st}} \times 10$ and subtraction. Condone arith. error (available on wrong eqtns provided coefficients not equal.) or 220 \$10 tickets or 99 \$16 tickets (ww Correct answer \Rightarrow M1)
	(d)	$0.85 \times \$16$ o.e. (\$)13.6(0) c.a.o.		M1 A1 (2)	[\$16 – 0,15 \times \$16] ww2
	(e)	$\frac{100}{125} \times \$10$ o.e. (\$)8		M1 A1 (2)	ww2
		TOTAL		12	
2	(a)	$120^2 = 77^2 + 55^2 - 2.55.77 \cos x$ $\cos x = \frac{77^2 + 55^2 - 120^2}{2.55.77}$ or $-\frac{5446}{8470} = \cos x = -0.64(29752)$ s.o.i. (-0.643) $x = 130(.0)$		M1 M1 A1 A1 (4)	Implied by next line Implied by correct answer which rounds to 130° Scale drawing \Rightarrow M0. ww \Rightarrow SC2
	(b)	$\sin y = \frac{55 \sin 45^\circ}{60}$ $\sin y = 0.648 (1812)$ s.o.i. $y = 40.4$		M2 A1 A1 (4)	If not scored, allow M1 for correct implicit eqtn Implied by answer 40° after some working Accept more accuracy but not less. www4 ($40.39^\circ - 40.41^\circ$; 40° ww \Rightarrow SC2)
	(c)	(i) 225° (ii)* 275°		B2 B2 \checkmark (4)	Correct method seen OR answer $222-224^\circ$, allow Sc1 $\checkmark 405^\circ$ – their x (provided $< 360^\circ$). Answer $291-293^\circ$, allow SC1
		TOTAL		12	

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3	(a)		<p>B1</p> <p>B1</p> <p>B1 (3)</p>	<p>Accept percentages or fractions but not ratios</p>
	(b)	<p>(i) 0.4×0.65 <u>ONLY</u> 0.26 c.a.o.</p> <p>(ii)* <u>Either</u> $0.4 \times 0.35\sqrt{}$ <u>or</u> $0.6\sqrt{} \times 0.45$</p> <p>$0.4 \times 0.35\sqrt{} + 0.6\sqrt{} \times 0.45$ <u>ONLY</u> 0.41 c.a.o.</p> <p>(iii)* <u>Either</u> $1 - (.6\sqrt{} \times .55\sqrt{})$ <u>or</u> $.26 + .14\sqrt{} + .27\sqrt{}$ 0.67 c.a.o.</p>	<p>M1</p> <p>A1</p> <p>M1</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>A1 (7)</p>	<p>www2</p> <p>Accepting their $\sqrt{}$ values for M marks</p> <p>www3</p> <p>www2</p>
	(c)	<p>(i) 18 c.a.o.</p> <p>(ii) $12 \div (\text{his } 18 + 6)$ o.e. 30 c.a.o.</p>	<p>B1</p> <p>M1</p> <p>A1 (3)</p>	<p>SC1 for 34.3 after 18 in (c) (i)</p>
	(d)	<p>(i) 22.5</p> <p>(ii)* Realises probability "STOP. STOP"</p> <p>0.33</p>	<p>B1</p> <p>M1</p> <p>dep.</p> <p>A1$\sqrt{}$</p> <p>(3)</p>	<p>Accept 22min 30sec</p> <p>Implied by correct answer after correct work. Dep. On 18 and 22.5 (approx.)</p> <p>$\sqrt{1 - \text{their (b) (iii)}}$ or $(\text{their } 0.6) \times (\text{their } 0.55)$</p>
TOTAL			16	
4	(a)	<p>Scales correct</p> <p>9 points correctly plotted (1mm)</p> <p>Reasonable curve through 9 points</p>	<p>S1</p> <p>P3</p> <p>C1$\sqrt{}$</p> <p>(5)</p>	<p>$-4 \leq x \leq 4$ and $-8 \leq y \leq 8$</p> <p>Allow P2 for 7 or 8 correct, P1 for 5 or 6 correct</p> <p>$\sqrt{}$ provided shape maintained, curvature OK and <u>not</u> ruled</p>
	(b)	<p>$-3.6 \leq x \leq -3.3, x = 0, 3.3 \leq x \leq 3.6$</p>	<p>B2 (2)</p>	<p>Allow B1 for 1 correct non-zero solution; condone (-3.5, 0)</p> <p>(answers must be in range <u>and</u> correct for their graph)</p>
	(c)	<p>Line from (-4, -3) to (4, 5), and ruled</p>	<p>B2 (2)</p>	<p>If B0, allow B1 for gradient 1 <u>or</u> intercept 1 on single line</p>
	(d)	<p>$g(1) = 2$</p> <p>$fg(1) = -8$</p> <p>$g^{-1}(4) = 3$</p> <p>$3.75 \leq x \leq 3.9$</p>	<p>B1</p> <p>B1</p> <p>B1</p> <p>B1 (4)</p>	<p>Not (1, 2)</p> <p>Lost if y-coordinate given.</p> <p>Answer must be OK for their graph</p>

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	(e)	Tangent drawn at $x = 3$ on curve Vert./Horiz. using scale Answer in range 5-10 and OK for theirs	B1 M1 A1 (3)	Not chord or daylight Dep. on reasonable approx to tangent used at $x = 3$ (N.B. Gradient = 4.5 + y-value of tangent at $x = 4$)
		TOTAL	16	
5	(a)	$\frac{1}{2} 10 \cdot 10 \cdot \sin 60^\circ$ o.e. 43.3 cm² or 25 $\sqrt{3}$	M1 A1 (2)	Any complete method including $\sqrt{15.5.5.5}$ ww2
	(b)	$2\pi r = 10$ s.o.i. $r = 1.59$ (15494cm)	M1 A1 (2)	Accept $\pi D = 10$ ww2
	(c)	(i) Tetrahedron or Triangular Pyramid 4 (his (a)) * 173(.2cm²) or 100 $\sqrt{3}$ (ii) Cylinder Uses π (any r) ² × 10 <u>ONLY</u> Uses π (his (b)) ² × 10 Correct or $\sqrt{\quad}$ in range 79.35- 79.65cm³ (iii) Cone  Appreciates hypotenuse = 10 $h = \sqrt{10^2 - (\text{his}(b))^2}$ 9.87(25362cm)	B1 M1 $\sqrt{A1}$ (3) B1 M1 M1 dep. A1 (4) B1 M1 A1 (4)	If not his (a) then correct Δ area method needed $\sqrt{4}$ (a) to 3s.f. Accept circular (based) prism <u>Not</u> $2\pi r^2 10$ or any other modifications Implies M2 Accept circular/round (based) pyramid e.g. right-angled Δ drawn or cos $x = \frac{\dots}{10}$
		TOTAL	15	
6	(a)	$2x(x + 4)(x + 1)$ (cm³) $2x^3 + 10x^2 + 8x$ (cm³)	B1 B1 (2)	Must see this. Ignore further <u>correct</u> work.

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	(b)	$2x - 2, x + 2, x$ Internal volume = $2x^3 + 2x^2 - 4x$ Wood = his (a) – his(Int. Vol.) Correctly simplifies to $8x^2 + 12x$	B3 B1 M1 A1 (6)	B1 each correct answer, any order <u>but in this form</u> (Both could be wrong) No errors
	(c)	(i) $8x^2 + 12x = 1980$ $2x^2 + 3x - 495 = 0$ } $\frac{p \pm \sqrt{q}}{r}$ form $\Rightarrow p = -3$ and $r = 4$ or 2×2 \Downarrow $\Rightarrow q = 3^2 - 4 \cdot 2 - 495$ $\Rightarrow x = 15$ www $\Rightarrow x = -16.5$ or $-\frac{33}{2}$ www	B1 (1) B1 B1 B1 (4)	No error seen. Needs = 0 Alt. method B2 $(x - 15)(2x + 33)$ or SC1 for sign error(s) in brackets Or $q = 3969$ or $\sqrt{q} = 63$. Allow for $p \mp \frac{\sqrt{q}}{r}$ If factorising method used, answers only score if correct <u>and</u> from correct bracket
		(ii) Uses +ve answer * 30 by 19 by 16	B1 $\sqrt{B1}$ (2)	Rejects -ve solution explicitly or implicitly $\sqrt{2}(\text{his}), (\text{his}) + 4, (\text{his}) + 1$
		TOTAL	15	
7	(a)	(i) $\overrightarrow{OS} = 3\mathbf{a}$ www (ii) $\overrightarrow{AB} = \mathbf{b} - \mathbf{a}$ www (iii) $\overrightarrow{CD} = \mathbf{a}$ www (iv) $\overrightarrow{OR} = 2\mathbf{a} + 2\mathbf{b}$ www (v) $\overrightarrow{CF} = 2\mathbf{a} - 2\mathbf{b}$ www	B1 B1 B1 B2 B2 (7)	If B0, allow SC1 for correct but unsimplified seen If B0, allow SC1 for correct but unsimplified seen
	(b)	(i) $ \mathbf{b} = 5$ (ii) $ \mathbf{a} - \mathbf{b} = 5$ www	B1 B1 (2)	

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	(c)	(i) Enlargement , S.F. 3, Centre 0	B2	Allow SC1 for Enlargement or (S.F. 3 <u>and</u> Centre 0) } SC1 for 'Mirrored in CF' o.e.
		(ii) Reflection In line CF o.e.	M1 A1 (4)	
	(d)	(i) 6 c.a.o.	B1	
		(ii) 60°	B1 (2)	
		TOTAL	15	
8	(a)	(i) \$60-80 (ii) Midpoints 10, 30, 50, 70, 90 + 120 Σfx attempted (12880) $\Sigma fx \div 200$ Final answer \$64.40 c.a.o.	B1 M1 M1* M1 A1 (5)	Needs at least 4 correct s.o.i. Dep. on previous M1 or their midpoints ± 0.5 Dep. on M1* Needs 2 d.p., www4 (64.4 \Rightarrow M3 AO)
	(b)	(i) (\leq)20, (\leq)40, (\leq)60, (\leq)80, (\leq)100, (\leq)140 10, 42, 90, 144, 180, 200 (ii) Scales correct and labelled or used to 140 and 200 6 plots correct (20, 10) \rightarrow (140, 200) Graph from (0, 0), line or curve	B1 B1 S1 P2 C1 (6)	<u>Not</u> for $\frac{20-40}{42}$ type Vert. 20cm \equiv 200 and Horiz. \equiv 14cm 140. Reversed axes SO P1 for 4 or 5 correct. 1mm accuracy Through all 6 points. Dep. on P1
	(c)	(i) Median (\$63-64) (ii) U.Q. (\$82-84) (iii) IQR (\$38-41) (iv) Using \$75 reading on Cum. Freq. Graph – 67 or 68 or 69 or 70 or 71 or 72	B1 B1 B1 M1 A1 (5)	<u>All</u> answers in (c) must <u>also</u> be correct for their graph (1mm) e.g. answer 130 implies this Must be integer answer and OK for their graph
		TOTAL	16	
9	(a)	Diagram 1 \Rightarrow 25% c.a.o. Diagram 2 \Rightarrow 12½% o.e. Diagram 3 \Rightarrow 37½% o.e. Diagram 4 \Rightarrow 60% o.e.	B1 B2 B2 B2 (7)	<u>For whole section reversed (a)</u> <u>or (b)</u> , treat as MR-1 per section For Diagrams 2-4 accept non% equivalents Also in each case if 2 not scored, allow SC1 if correct idea seen (e.g. $\frac{1}{2}h \div 4h$ for Diagram 2)

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(b)	Diagram 5 \Rightarrow 1/9 o.e. fraction Diagram 6 \Rightarrow 1/25 o.e. Diagram 7 \Rightarrow 5/9 o.e.	B1 B2 B3 (6)	In Diagrams 6 and 7, accept non-fraction equivalents. If B0, allow SC1 for $(\pi)5^2$ seen If B0, allow SC1 for $(k\pi)2^2$ and SC1 for $(k\pi)3^2$ seen ($k=1$ or $x/360$) N.B. 4π <u>must</u> be from $\pi 2^2$ and not $2\pi 2$
	TOTAL	13	
	FINAL TOTAL	130	

Grade thresholds taken for Syllabus 0580/0581 (Mathematics) in the June 2003 examination.

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 1	56	-	40	25	18
Component 2	70	59	40	28	-
Component 3	104	-	73	50	41
Component 4	130	93	56	32	-

The threshold (minimum mark) for B is set halfway between those for Grades A and C.
 The threshold (minimum mark) for D is set halfway between those for Grades C and E.
 The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.
 Grade A* does not exist at the level of an individual component.