

**MARK SCHEME for the May/June 2009 question paper**  
**for the guidance of teachers**

**0607 CAMBRIDGE INTERNATIONAL MATHEMATICS**

**0607/03**

Paper 3 (Core), maximum raw mark 96

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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**M** marks are given for a correct method.

**A** marks are given for an accurate answer following a correct method.

**B** marks are given for a correct statement or step.

**D** marks are given for a clear and appropriately accurate drawing.

**P** marks are given for accurate plotting of points.

**E** marks are given for correctly explaining or establishing a given result.

### Abbreviations

cao correct answer only

cso correct solution only

ft follow through

oe or equivalent

soi seen or implied

ww without working

www without wrong working

<b>1</b>	<b>(a) (i)</b>	55	<b>B1</b>	
	<b>(ii)</b>	7	<b>B1</b>	
	<b>(iii)</b>	11	<b>B1</b>	
	<b>(b) (i)</b>	82	<b>B1</b>	
	<b>(ii)</b>	38	<b>B1</b>	
	<b>(c)</b>	$\frac{89}{100}$ oe	<b>B1</b>	
	<b>(d)</b>	1780 ft	<b>B1</b>	ft their (c) $\times$ 2000 [7]

<b>2</b>	<b>(a) (i)</b>	7	<b>B1</b>	
	<b>(ii)</b>	7.5	<b>B1</b>	
	<b>(iii)</b>	7.9	<b>B1</b>	
	<b>(iv)</b>	3	<b>B1</b>	
	<b>(v)</b>	9	<b>B1</b>	
	<b>(b)</b>	Radius drawn giving angles of $72^\circ$ and $36^\circ \pm 2^\circ$ Labels 9 and 10 correctly placed	<b>B1</b> <b>B1</b>	Must be ruled If 2 sectors and 9 is larger
	<b>(c)</b>	Ruled bars of heights 5, 2, 2, 1	<b>B3</b>	<b>B2</b> for 3 correct, <b>B1</b> for 2 correct. Deduct 1 for freehand but reasonable
	<b>(d)</b>	30	<b>B2</b>	If <b>B0</b> , <b>M1</b> for $3 \div 10 \times 100$ oe [12]

<b>3 (a)</b>	150	<b>B2</b>	If <b>B0, M1</b> for $180 \div 6 \times 5$
<b>(b)</b>	$121 \div 11$ oe $\times 6$ oe	<b>M1</b> <b>M1</b>	Accept $6 \times 11 = 66$ , $5 \times 11 = 55$ <b>M1</b> $55 + 66 = 121$ <b>M1</b>
<b>(c)</b>	4.76 (4.761 – 4.762))	<b>B2</b>	If <b>B0, M1</b> for $3 \div 63 \times 100$ oe
<b>(d)</b>	$63 \times 1000$ $6.3 \times 10^4$ www3	<b>M1</b> <b>A1A1</b>	<b>SC2</b> for $63 \times 10^3$ oe
<b>(e) (i)</b>	14.3 (14.28 – 14.29)	<b>B2</b>	<b>M1</b> for $100 \div 7$
<b>(ii)</b>	6.9(0) (6.896 – 6.897)	<b>B2</b>	If <b>B0, M1</b> for $100 \div 14.5$ <b>[13]</b>

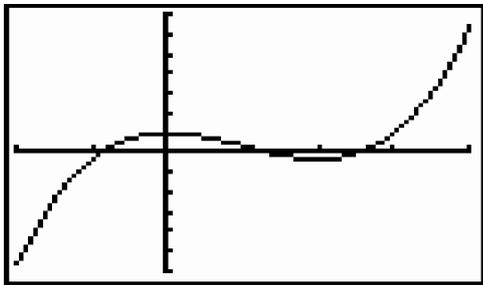
<b>4 (a)</b>	<p><math>y = \frac{1}{2}x^2 + 2</math> drawn</p>	<b>B1</b> <b>B1</b>	For approx straight line with grad approx $\frac{1}{2}$ , reaching curve twice For approx straight line with y-intercept approx 2, also reaching curve twice
<b>(b)</b>	-1.2808, 0.7808	<b>B1B1</b>	Accept 2dp (-1.28 and 0.78) or better -1.281 to -1.280 , 0.781 or 0.7807 to 0.7808 <b>SC1</b> - 1.3, 0.8
<b>(c)</b>	Line would <b>not meet</b> the curve even if extended oe	<b>B1</b>	<b>[5]</b>

<b>5 (a)</b>	42	<b>B2</b>	If <b>B0, M1</b> for $0.5 \times 12 \times 7$
<b>(b)</b>	63	<b>B2</b>	If <b>B0, M1</b> for $0.5 \times 6 \times 7 +$ their 42 oe
<b>(c)</b>	105	<b>B1</b>	
<b>(d)</b>	35	<b>B1</b>	<b>[6]</b>

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<b>6 (a)</b>	7 correct points	<b>P3</b>	<b>P2</b> for 5 or 6 correct, <b>P1</b> for 3 or 4
<b>(b)</b>	Negative	<b>B1</b>	
<b>(c) (i)</b>	3	<b>B1</b>	
<b>(ii)</b>	Straight line through (6, <b>their</b> 3) with <b>negative</b> gradient through (8, 0.5 to 1.5)	<b>M1</b> <b>A1</b>	Plotted or implied (within 2 mm of $(\bar{x}, \bar{y})$ ) <b>A0</b> if not ruled For 3 to 8 at least <b>[7]</b>

<b>7 (a) (i)</b>	37.68 – 37.7	<b>B2</b>	If <b>B0</b> , <b>M1</b> for $\frac{1}{3} \times \pi \times 3^2 \times 4$ Accept $12\pi$
<b>(ii)</b>	283 (282.6 – 282.8) ft	<b>B2 ft</b>	If <b>B0</b> , <b>M1</b> for <b>(i)</b> $\times 7.5$
<b>(b) (i)</b>	75.36 – 75.41	<b>B3</b>	If <b>B0</b> , <b>M1</b> for $\pi \times 3 \times 5$ <b>M1</b> for $\pi \times 3^2$ Accept $24\pi$
<b>(ii)</b>	0.007536 – 0.007541 ft	<b>B1 ft</b>	ft their <b>(i)</b>
<b>(iii)</b>	928 cao	<b>B2</b>	If <b>B0</b> , <b>M1</b> for $7 \div$ their <b>(ii)</b> <b>[10]</b>

<b>8 (a)</b>	 <p>Cubic shape with max then min Cross x-axis 3 times 2 x-intercepts positive Max point close to (0, 1)</p>	<b>B1</b> <b>B1</b> <b>B1</b> <b>B1</b>	At least from –2 to 4 Dependent on previous <b>B1</b> Dependent on first <b>B1</b>
<b>(b) (i)</b>	1	<b>B1</b>	
<b>(ii)</b>	3.04(3.041 – 3.042)	<b>B1</b>	
<b>(c)</b>	–0.879, 1.35, 2.53 (–0.8794 to –0.8793, 1.347..., 2.532...)	<b>B1, B1</b> , <b>B1</b>	If <b>B0</b> , <b>SC2</b> for –0.88, 1.3, 2.5 or <b>SC1</b> for 2 of these. If <b>B1</b> , <b>SC1</b> for other two to 2 sf
<b>(d)</b>	(2, –0.333)	<b>B1, B1</b>	Allow –0.33 or $-\frac{1}{3}$
<b>(e)</b>	–1.43 (–1.426 to –1.425)	<b>B1</b>	
<b>(f)</b>	–5.67 to 6.33 (–5.666 to –5.667 to 6.3333..) oe	<b>B1, B1</b>	Allow –5.6 or –5.7 and 6.3 <b>[14]</b>

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<b>9 (a) (i)</b>	55	<b>B2</b>	<b>M1</b> for $\frac{1}{2}(180 - 70)$
<b>(ii)</b>	110	<b>B2</b>	<b>M1</b> for 180–70 or for 360–90–90–70 soi (may be on diagram) or for 180 – 2[90 – their <b>(i)</b> ] <b>ft</b>
<b>(b)</b>	Diameter	<b>B1</b>	<b>[5]</b>

<b>10 (a)</b>	$x = 1$	<b>B1</b>	
<b>(b)</b>	$-\frac{4}{7}$ oe $-0.571$ or $-0.5714\dots$	<b>B2</b>	<b>B1</b> for – ve, <b>B1</b> for $\frac{4}{7}$ Allow $-0.57$
<b>(c)</b>	(4.5, 4)	<b>B1, B1</b>	
<b>(d)</b>	(their 4) <sup>2</sup> + (their 7) <sup>2</sup> 8.06 (8.062...) <b>ft</b> <b>www2</b>	<b>M1ft</b> <b>A1ft</b>	<b>ft</b> from <b>(b)</b>
<b>(e)</b>	$\tan(\text{angle}) = \frac{\text{their } 4}{\text{their } 7}$ oe 29.7 (29.74 – 29.75....) <b>ft</b> <b>www2</b>	<b>M1ft</b> <b>A1ft</b>	<b>ft</b> from <b>(b)</b> or <b>(d)</b> Radians 0.519 give <b>M1A1</b> <b>[9]</b>

<b>11 (a)</b>	$\frac{4}{5}$ cao	<b>B2</b>	If <b>B0</b> , <b>M1</b> for $\frac{2 \times 7}{5} - \frac{4}{2}$ implied by $\frac{8}{10}$ oe
<b>(b)</b>	4, 5	<b>B1, B1</b>	May be embedded
<b>(c)</b>	20	<b>B2</b>	If <b>B0</b> , <b>M1</b> for $\frac{2x}{5} = 8$ (Must reach correct equation with one variable term and one constant term only.)
<b>(d)</b>	$\frac{y}{2} = \frac{2x}{5} - 1$ oe $y = 2\left(\frac{2x}{5} - 1\right)$ oe <b>www 2</b> $\frac{4x}{5} - 2, \frac{4x - 10}{5}$	<b>M1</b> <b>M1</b>	for re-arranging correctly for + or $-\frac{y}{2}$ oe for multiplying by 2 correctly (any order) <b>Mark final answer</b> <b>[8]</b>