
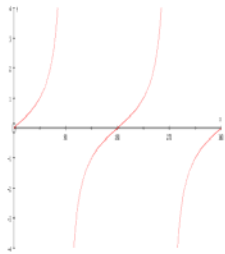


**Mark Scheme 4752**  
**January 2006**

Section A

1	7/9 or 140/180 o.e.	2	B1 for $180^\circ = \pi$ rad o.e. or 0.78 or other approximations	2
2	224	2	M1 for $2^3 + 3^3 + 4^3 + 5^3$	2
3	triangle divided into 2 rt angled tris $\sqrt{3}$ and 1 indicated 60 indicated	H1 S1 A1		3
4	16.1 	4	M3 for $\frac{1}{4}\{8.2 + 4.2 + 2(6.4 + 5.5 + 5 + 4.7 + 4.4)\}$ M2 for one slip/error M1 for two slips/errors	
	overestimate + expn eg sketch	1		5
5	(i)  tan $x = \frac{3}{4}$	2	no numbers required on axes unless more branches shown. G1 for a correct first sweep	
	(ii) 36.8 to 36.9 and 216.8 to 216.9	M1 A1A1	Allow 37, 217	5
6	$y'' = 2x - 6$ $y'' = 0$ at $x = 3$ $y' = 0$ at $x = 3$ showing $y'$ does not change sign	B1 B1 B1 E1	or that $y''$ changes sign	4
7	(i) 5	2	M1 for $6 = 1.2r$	
	(ii) 5.646... to 2 sf or more	3	M2 for $2 \times 5x \sin 0.6$ or $\sqrt{(5^2 + 5^2 - 2.5.5. \cos 1.2)}$ or $5 \sin 1.2 / \sin 0.971$ M1 for these methods with 1 error	5
8	$\frac{2}{3}x^{\frac{3}{2}} - 3x^{-2} + c$ o.e.	5	1 for each element	5
9	(i) $\log_{10} y = 0.5x + 3$	B3	B1 for each term scored in either part	
	(ii) $y = 10^{0.5x+3}$ isw	2	o.e. e.g. $y = 1000 \times 10^{\sqrt{x}}$	5

## Section B

<b>10</b>	<b>i</b>	$y' = 6 - 2x$ $y' = 0$ used $x = 3$ $y = 16$  (0, 7) (-1, 0) and (7,0) found or marked on graph  sketch of correct shape	M1 M1 A1 A1  3  1	condone one error  1 each  must reach pos. y - axis	   8
	<b>ii</b>	58.6 to 58.7	3 M1	B1 for $7x + 3x^2 - x^3/3$ [their value at 5] - [their value at 1] dependent on integration attempted	3
	<b>iii</b>	using his (ii) and 48	1		1
<b>11</b>	<b>i</b>	$3x^2 - 6$	2	1 if one error	2
	<b>ii</b>	$-\sqrt{2} < x < \sqrt{2}$	3	M1 for using their $y' = 0$ B1 f.t. for both roots found	3
	<b>iii</b>	subst $x = -1$ in their $y'$ [ $= -3$ ] $y = 7$ when $x = -1$ $y + 3x = 4$  $x^3 - 6x + 2 = -3x + 4$ (2, -2) c.a.o.	B1 M1 A1  M1 A1,A1	f.t. f.t. 3 terms  f.t.	   6
<b>12</b>	<b>i</b>	A 23	2	M1 for 5, 7, 9 etc or AP with $a = 5, d = 2$	2
		B 24	2	M1 for $51 = 5 + 2(n - 1)$ o.e.	2
		C 480	2	M1 for attempted use of sum of AP formula eg $20/2[10+19 \times 2]$	2
<b>ii</b>	A 11.78 – 11.80  B $5 \times 1.1^{n-1} > 50$ $1.1^{n-1} > 10$ $(n - 1) \log 1.1 > 1$ $n - 1 > 1/\log 1.1$  n = 26	2  B1 B1 L1 A1  1	Or other step towards completion (NB answer given)  independent		