

Question Number	Scheme	Marks
5(a)	$3y - 2x = 30 \Rightarrow m = \frac{2}{3}$	B1
	$y = -\frac{3}{2}(x - 24), y = -\frac{3}{2}x + 36, 2y + 3x = 72, \frac{y - 0}{x - 24} = -\frac{3}{2}$	M1 A1ft
	Full method to find one co-ordinate of P E.g. Solves $\frac{2}{3}x + 10 = -\frac{3}{2}(x - 24)$	M1
	Coordinates of P (12,18)	A1
		(5)
(b)	$y = 0, 3y - 2x = 30 \Rightarrow x = \dots$	M1 (B1 on EPEN)
	Area $BPA = \frac{1}{2} \times (24 + "15") \times "18" = 351$	dM1 A1 cso
		(3)
		(8 marks)

Question Number	Scheme	Marks
5(a)	$\angle BOD = \pi - 2 \times 0.7 = 1.742^*$	B1*
		(1)
(b)	Area of $BOD = \frac{1}{2} \times 3^2 \sin 1.742$ (= awrt 4.43)	M1
	Area of R is: $\frac{1}{2} \times 3^2 \times 1.742 - \frac{1}{2} \times 3^2 \sin 1.742$ or $\frac{1}{2} \times \pi \times 3^2 - \frac{1}{2} \times 3^2 \sin 1.742 - 2 \times \frac{1}{2} \times 3^2 \times 0.7$	dM1
	= awrt 3.4 (m ²)	A1
		(3)
(c)	$BD = \sqrt{3^2 + 3^2 - 2 \times 3 \times 3 \cos 1.742}$ (= awrt 4.59) or $BD = 2 \times 3 \sin\left(\frac{1.742}{2}\right)$ or $BD = 2 \times 3 \cos 0.7$ or $BD = \frac{3 \sin 1.742}{\sin\left(\frac{\pi - 1.742}{2}\right)}$ or arc $BCD = 3 \times 1.742$ (= 5.226)	M1
	Perimeter of R is: $3 \times 1.742 + "BD"$	dM1
	= awrt 9.8 (m)	A1
		(3)
		Total 7

Question Number	Scheme	Marks
10	$(k-1)x^6 + 4x^3 + (k-4) = 0$	
(a)	$3.5x^6 + 4x^3 + 0.5 = 0 \Rightarrow 7x^6 + 8x^3 + 1 = 0$ $\Rightarrow (x^3 + 1)(7x^3 + 1) = 0$ $\Rightarrow x^3 = -1, x^3 = -\frac{1}{7}$ $\Rightarrow x = -1, x = -\frac{1}{\sqrt[3]{7}}$	M1 A1 A1 (3)
(b)	Attempts $b^2 - 4ac = 16 - 4(k-1)(k-4)$ $= 20k - 4k^2$ Solves $b^2 - 4ac < 0 \Rightarrow 4k(5-k) < 0 \Rightarrow k < 0, k > 5$	M1 A1 dM1 A1 (4) (7 marks)

Question Number	Scheme	Marks
3(i)	$\sqrt{8} = 2\sqrt{2}$ seen anywhere in the solution (see notes)	B1
	$(x + \sqrt{2})^2 + (3x - 5\sqrt{8})^2$ $= x^2 + 2x\sqrt{2} + 2 + 9x^2 - 30x\sqrt{8} + 25 \times 8$	M1
	$= 10x^2 - 58x\sqrt{2} + 202$	A1
		(3)
(ii)	$\sqrt{3}(4y - 3\sqrt{3}) = 5y + \sqrt{3}$ $\Rightarrow 4\sqrt{3}y - 9 = 5y + \sqrt{3}$ $\Rightarrow 4\sqrt{3}y - 5y = 9 + \sqrt{3}$	M1
	$\Rightarrow y = \dots$ or $\Rightarrow ky = \dots$ eg $y = \frac{9 + \sqrt{3}}{4\sqrt{3} - 5}$ " or "23" $y = \frac{9 + \sqrt{3}}{23}$	dM1
	$y = \frac{9 + \sqrt{3}}{4\sqrt{3} - 5} \times \frac{4\sqrt{3} + 5}{4\sqrt{3} + 5} \Rightarrow y = \frac{\dots}{23}$	ddM1
	$y = \frac{57}{23} + \frac{41}{23}\sqrt{3}$ (or $y = 2\frac{11}{23} + 1\frac{18}{23}\sqrt{3}$)	A1
		(4)
	(ii) Alternative 1:	
	$\sqrt{3}(4p + 4q\sqrt{3} - 3\sqrt{3}) = 5(p + q\sqrt{3}) + \sqrt{3}$ $\Rightarrow 4p\sqrt{3} + 12q - 9 = 5p + 5q\sqrt{3} + \sqrt{3}$ $\Rightarrow 4p = 5q + 1, 12q - 9 = 5p$	M1 dM1
	$\Rightarrow 4p = 5q + 1, 12q - 9 = 5p$ $\Rightarrow p = \dots, q = \dots$	ddM1
	$y = \frac{57}{23} + \frac{41}{23}\sqrt{3}$ (or $y = 2\frac{11}{23} + 1\frac{18}{23}\sqrt{3}$)	A1
		Total 7