

Q	Marking instructions	AO	Marks	Typical solution
10(a)	Rewrites the equation as $y = \sqrt{2}x^{-2}$ PI by correct derivative.	1.1b	B1	$y = \sqrt{2}x^{-2}$ $\frac{dy}{dx} = -\frac{2\sqrt{2}}{x^3}$
	Differentiates with their power of x correct provided original power is negative.	1.1a	M1	$\text{Grad at } \left(2, \frac{\sqrt{2}}{4}\right) = -\frac{2\sqrt{2}}{8} = -\frac{\sqrt{2}}{4}$
	Substitutes $x = 2$ to obtain correct gradient.	1.1b	A1	$\text{Tangent at } \left(2, \frac{\sqrt{2}}{4}\right) \text{ is}$ $y - \frac{\sqrt{2}}{4} = -\frac{\sqrt{2}}{4}(x - 2)$
	Obtains correct equation of tangent to curve, any form.	1.1b	A1	$y = \frac{3\sqrt{2}}{4} - \frac{x\sqrt{2}}{4}$
	Subtotal		4	

Q	Marking instructions	AO	Marks	Typical solution
10(b)	<p>Eliminates y for their tangent and the given curve to find other intersection point.</p> <p>Or</p> <p>Equates $\frac{dy}{dx}$ to the gradient of the perpendicular to their tangent.</p>	3.1a	M1	
	<p>Simplifies to obtain correct cubic equation. PI by $x = -1$</p> <p>Or</p> <p>Obtains correct equation $-\frac{2\sqrt{2}}{x^3} = 2\sqrt{2}$ (OE)</p>	1.1a	A1	<p>Meets $y = \frac{\sqrt{2}}{x^2}$ when</p> $\frac{\sqrt{2}}{x^2} = \frac{3\sqrt{2}}{4} - \frac{x\sqrt{2}}{4}$ $\frac{1}{x^2} = \frac{3}{4} - \frac{x}{4}$ $x^3 - 3x^2 + 4 = 0$ $(x - 2)^2(x + 1) = 0$
	Finds other intersection value of $x = -1$	1.1b	A1	$x^3 - 3x^2 + 4 = 0$ $(x - 2)^2(x + 1) = 0$
	<p>Substitutes $x = -1$ to obtain the correct gradient at the other intersection point.</p> <p>Or</p> <p>Obtains $y = \sqrt{2}$ at the other intersection point.</p>	1.1b	B1	<p>Other intersection is at $x = -1$</p> $\frac{dy}{dx} = \frac{-2\sqrt{2}}{(-1)^3} = 2\sqrt{2}$ $2\sqrt{2} \times \left(-\frac{\sqrt{2}}{4}\right) = -1$
	<p>Completes a reasoned argument to show the required result using the perpendicular gradients condition.</p> <p>Or</p> <p>Completes argument by finding the equation of the line with gradient $-\frac{\sqrt{2}}{4}$ passing through $(-1, \sqrt{2})$ and verifying that this equation is identical to the equation found in part (a). OE</p>	2.1	R1	Perpendicular to curve so normal
	Subtotal		5	
	Question 10 Total		9	