Question Number	Scheme	Notes	Marks
4(a)	$y = 25x^{-1} \Rightarrow \dfrac{\mathrm{d}y}{\mathrm{d}x} = -25x^{-2}$ $xy = 25 \Rightarrow y + x\dfrac{\mathrm{d}y}{\mathrm{d}x} = 0$ $\dfrac{\mathrm{d}y}{\mathrm{d}x} = \dfrac{\mathrm{d}y}{\mathrm{d}t}\dfrac{\mathrm{d}t}{\mathrm{d}x} = -\dfrac{5}{t^2}.\dfrac{1}{5}$	Attempts a derivative expression, such as $\dfrac{\mathrm{d}y}{\mathrm{d}x} = kx^{-2}$ or $x\dfrac{\mathrm{d}y}{\mathrm{d}x} = ky$ or $\dfrac{\mathrm{d}y}{\mathrm{d}x} = \dfrac{\text{their}\dfrac{\mathrm{d}y}{\mathrm{d}t}}{\text{their}\dfrac{\mathrm{d}x}{\mathrm{d}t}}$	M1
	$\dfrac{\mathrm{d}y}{\mathrm{d}x} = -25x^{-2}$ or $\dfrac{-y}{x}$ or $\dfrac{-1}{t^2}$	Correct derivative.	A1
	$y - \dfrac{5}{t} = -\dfrac{1}{t^2}(x - 5t)$	Uses $y - \dfrac{5}{t} = (\text{their gradient}) \times (x - 5t)$ or $y = (\text{their gradient})x + c$ using $x = 5t, y = \dfrac{5}{t}$ in an attempt to find c. Their gradient must be a function of t for marks to be awarded.	M1
	$t^2y + x = 10t$ *	cso	A1
			(4)
Alt 4(a)	Intersect when $(10t - t^2y)y = 25$	Substitutes given line equation into the curve equation to find intersections	M1
	$\Rightarrow t^2y^2 - 10ty + 25 = 0$	Correct equation	A1
	$\Rightarrow (ty - 5)^2 = 0 \Rightarrow y = \dfrac{5}{t}$ is single root.	Shows the equation has a single root.	M1
	Single root when $y = \dfrac{5}{t}$ means the line is the tangent to H at P.	All work correct, with correct conclusion.	A1
			(4)
4(b)	$t^2(-5) + 15 = 10t$	Substitute $(15, -5)$ into equation of tangent	M1
	$(t + 3)(t - 1) = 0 \Rightarrow t = ..$	Solves via any valid means	M1
	$\Rightarrow t = -3, t = 1$ (or one correct point)	Both values of t **or** one correct coordinate pair.	A1
	$\left(-15, -\dfrac{5}{3}\right)$ and $(5, 5)$	Both correct sets of coordinates.	A1
			(4)
ALT	$t_1^2y + x = 10t_1$ $t_2^2y + x = 10t_2$	Form equations with their t_1, t_2 and attempt to solve for x and y	M1
	$(x =)\dfrac{10t_1t_2}{(t_1 + t_2)} = 15, (y =)\dfrac{10}{(t_1 + t_2)} = -5$	Equates to coordinate and attempt to solve for t_1, t_2	M1
	$t_1 = -3, t_2 = 1$ (or one correct point)	Both values of t **or** one correct coordinate pair.	A1
	$\left(-15, -\dfrac{5}{3}\right)$ and $(5, 5)$	Both correct sets of coordinates.	A1
			(4)
			Total 8