

Question		Answer	Marks	AO	Guidance	
5	(a)	$3x^2 - 6xy - 3x^2 \frac{dy}{dx} + 2y \frac{dy}{dx} = 0$	M1*	1.1a	Attempt implicit differentiation	Either of the two $\frac{dy}{dx}$ terms correct, allowing sign errors
			A1	2.1	Correct derivative www	Condone no '=' on RHS Condone $\frac{dy}{dx} = \dots$ as long as not used
		$3x^2 - 6xy + (2y - 3x^2) \frac{dy}{dx} = 0$ OR $-3x^2 \frac{dy}{dx} + 2y \frac{dy}{dx} = 6xy - 3x^2$	M1d*	1.1a	Attempt to make $\frac{dy}{dx}$ the subject	Either collect like terms on each side or take out a common factor of $\frac{dy}{dx}$ Must have two terms involving $\frac{dy}{dx}$ and two terms without $\frac{dy}{dx}$
		$(2y - 3x^2) \frac{dy}{dx} = 6xy - 3x^2$ $\frac{dy}{dx} = \frac{6xy - 3x^2}{2y - 3x^2}$ A.G.	A1	2.1	Obtain correct $\frac{dy}{dx}$	Obtain given answer having collected like terms on either side and taken out a common factor (possibly with both steps being done in one go)
		[4]				
	(b)	$\frac{dy}{dx} = 9$	B1	1.1	Obtain gradient of 9	Could be implied by $-\frac{1}{9}$
		$m' = -\frac{1}{9}$	B1FT	1.1	Correct gradient of normal	FT their m
		$y - 2 = -\frac{1}{9}(x - 1)$	M1	1.1a	Attempt equation of normal	Using (1, 2) and their normal gradient (M0 if using gradient of tangent) Gradient must be numerical
		$x + 9y = 19$	A1	1.1	Obtain correct three term equation	Any correct equiv
		[4]				