1. A curve C is described by the equation

$$3x^2 + 4y^2 - 2x + 6xy - 5 = 0.$$

Find an equation of the tangent to C at the point $(1, -2)$, giving your answer in the form $ax + by + c = 0$, where a, b and c are integers.

(7)

(Mark scheme on next page)

Question Number	Scheme	Marks
1.	Differentiates to obtain : $6x+8y\frac{dy}{dx}-2,$ $\ldots\ldots\ldots\ldots\ldots\ldots+(6x\frac{dy}{dx}+6y)=0$ $\left[\frac{dy}{dx}=\frac{2-6x-6y}{6x+8y}\right]$ Substitutes $x=1, y=-2$ into expression involving $\frac{dy}{dx}$, to give $\frac{dy}{dx}=-\frac{8}{10}$ Uses line equation with numerical 'gradient' $y-(-2)=$ (their gradient)$(x-1)$ or finds c and uses $y=$ (*their gradient*) x + "c" To give $5y+4x+6=0$ (or equivalent = 0)	M1 A1, +(B1) M1, A1 M1 A1√ **[7]**