3   **(a)** Given that $f(x) = x^2 + 2x$, use differentiation from first principles to show that $f'(x) = 2x + 2$.

[4]

(b) The gradient of a curve is given by $\dfrac{dy}{dx} = 2x + 2$ and the curve passes through the point $(-1, 5)$.

Find the equation of the curve.

[3]