**2:**

$$\frac{d^2y}{dx^2} - 4\frac{dy}{dx} - 5y^2 = e^{x^2-9}$$

Given that $y = 2$ and $\frac{dy}{dx} = -1$ at $x = 3$, determine a Taylor series for $y$ in ascending powers of $(x - 3)$, up to and including the term in $(x - 3)^3$

**(5)**

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**Question 2 continued**

**(Total for Question 2 is 5 marks)**