4. (a) Determine the general solution of the differential equation

$$\frac{d^2y}{dx^2} - 8\frac{dy}{dx} + 16y = 48x^2 - 34$$

(5)

Given that $y = 4$ and $\frac{dy}{dx} = 21$ at $x = 0$

(b) determine the particular solution of the differential equation.

(4)

(c) Hence find the value of y at $x = -2$, giving your answer in the form $pe^q + r$ where p, q and r are integers to be determined.

(2)

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Question 4 continued

(Total for Question 4 is 11 marks)