Advanced Higher Maths
SQA 2023 Paper 2
Question 7

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Maths.scot

(a) Solve the differential equation

$$\frac{dy}{dx} - 2y = 6e^{5x}$$

given that when $x = 0$, $y = -1$.

Express y in terms of x. **4**

(b) The solution of the differential equation in (a) is also a solution of

$$\frac{d^3y}{dx^3} - 5\frac{d^2y}{dx^2} = ke^{2x}, \quad k \in \mathbb{R}.$$

Find the value of k. **2**

Answers:

(a) $y = 2e^{5x} - 3e^{2x}$

(b) $k = 36$