2. $$y = (1 - 3x)^A + e^{Bx}$$

where A and B are non-zero constants.

(a) Determine $\frac{d^3y}{dx^3}$ in terms of A, B and x.

(3)

Given that the Maclaurin series expansion for y in ascending powers of x, up to and including the term in x^3, is

$$y = 2 + kx^3$$

where k is a constant,

(b) determine the value of A and the value of B.

(4)

(c) Hence determine the value of k, giving your answer as a fully simplified fraction.

(3)

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Question 2 continued

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Question 2 continued

(Total for Question 2 is 10 marks)