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1 (a) Use the definitions of hyperbolic functions in terms of exponentials to prove that

$$8\cosh^4 x = \cosh 4x + p\cosh 2x + q$$

where p and q are constants to be determined.

(3)

(b) Hence, or otherwise, solve the equation

$$\cosh 4x - 17\cosh 2x + 9 = 0$$

giving your answers in exact simplified form in terms of natural logarithms.

(5)

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Question 1 continued

Q1

(Total 8 marks)