7. $$I_n = \int \cosh^n 2x \, dx \qquad n \geqslant 0$$

(a) Show that, for $n \geqslant 2$

$$I_n = \frac{\cosh^{n-1} 2x \sinh 2x}{2n} + \frac{n-1}{n} I_{n-2}$$

(5)

(b) Hence determine

$$\int (1 + \cosh 2x)^3 \, dx$$

collecting any like terms in your answer.

(4)

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Question 7 continued

(Total for Question 7 is 9 marks)

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