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7 **(a)** Given that $y = x\cos 2x$, find $\dfrac{\mathrm{d}y}{\mathrm{d}x}$. [2]

(b) Hence find $\int x\sin 2x \, \mathrm{d}x$. [4]

8 An arithmetic progression has first term t and common difference 1.5.
The 4th, 8th and 20th terms of this arithmetic progression form the 1st, 2nd and 3rd terms of a geometric progression.

(a) Find the value of t. [5]

(b) Find the common ratio of the geometric progression. [2]

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