**5** Given that $y = x^2 \tan\frac{x}{2}$, use calculus to find the approximate change in $y$ as $x$ increases from $\frac{\pi}{3}$ to $\frac{\pi}{3} + h$, where $h$ is small. [4]

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**6** **(a)** Using an appropriate quadratic factorisation, find the first three terms in the binomial expansion of $(9x^2 + 12x + 4)^5$, in ascending powers of $x$.
You must simplify your coefficients. [4]

**(b)** Find the term independent of $x$ in the expansion of $\left(\frac{6}{x^2} + \frac{x^4}{2}\right)^{12}$. [2]