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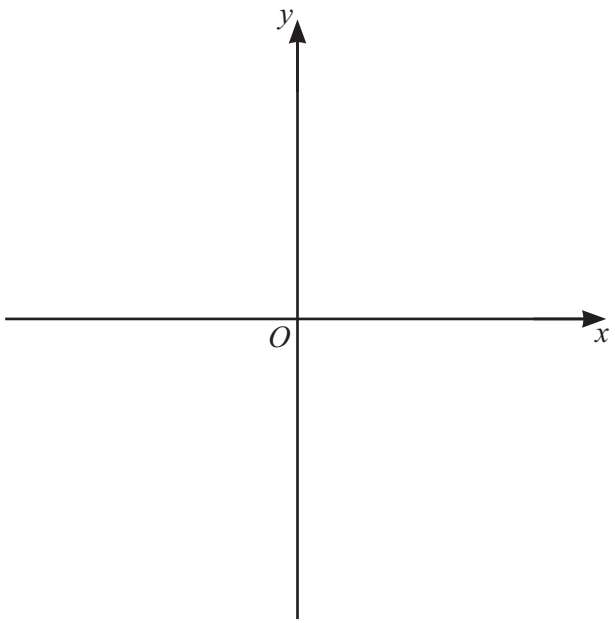
6 **(a)** Using an appropriate quadratic factorisation, find the first three terms in the binomial expansion of $(9x^2 + 12x + 4)^5$, in ascending powers of x.
You must simplify your coefficients. [4]

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

7 **(a)** The function f is defined by $\mathrm{f}(x) = 2\mathrm{e}^{-x} + 3$ for $x \in \mathbb{R}$.

On the axes, sketch the graph of $y = \mathrm{f}(x)$ and hence, on the same axes, sketch the graph of $y = \mathrm{f}^{-1}(x)$.
Show clearly

- the positions of any points where your graphs meet the coordinate axes
- the positions of any asymptotes. [4]



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