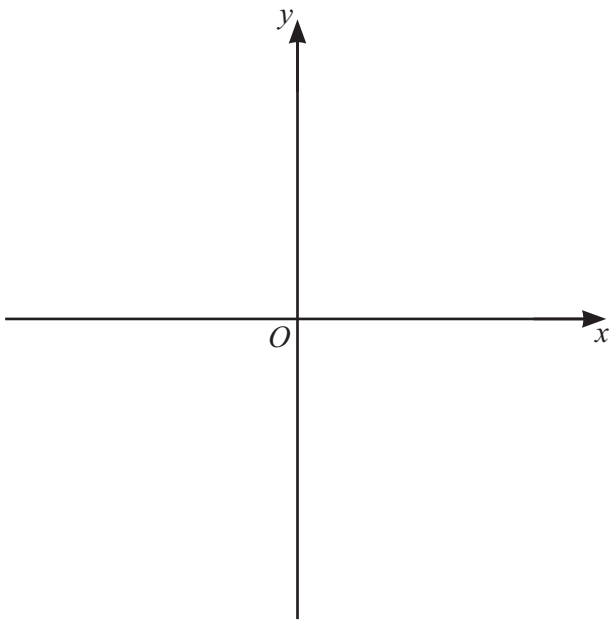
7 **(a)** The function f is defined by $\mathrm{f}(x) = 2\mathrm{e}^{-x} + 3$ for $x \in \mathbb{R}$.

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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(b) The function g is defined by $g(x) = 2 - \frac{3}{e^x + 2}$ for $x \geqslant 0$.

Given that g^{-1} exists, find an expression for $g^{-1}(x)$ and state its domain. [4]

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8 **(a)** Solve the equation $(2-3\cot x)\cos x = 0$ for $0 < x \leqslant \frac{\pi}{2}$. [3]

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