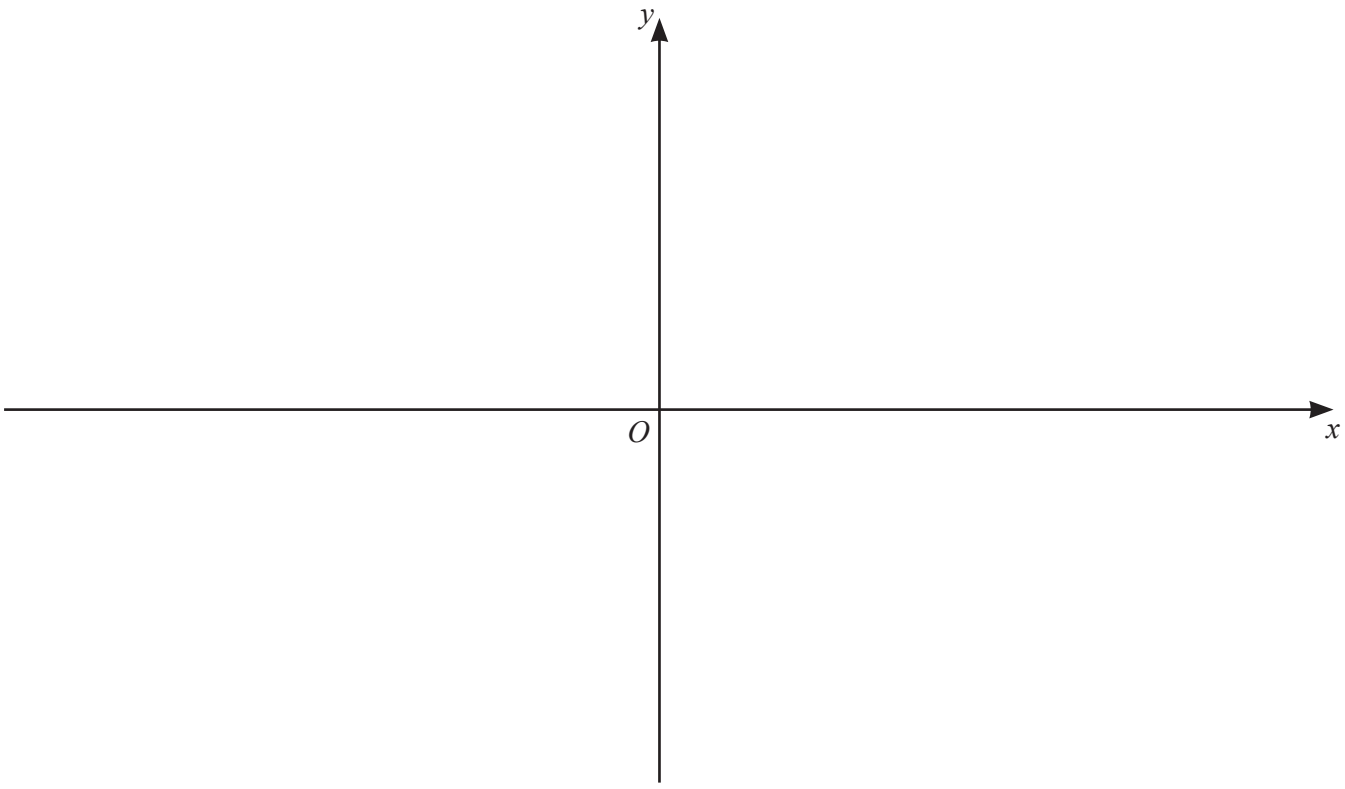
4 A function f is such that $\mathrm{f}(x) = 2 + \mathrm{e}^{-3x}, \quad x \in \mathbb{R}$.

(a) Write down the range of f. [1]

(b) Find an expression for f^{-1}. [2]

(c) On the axes, sketch the graphs of $y = \mathrm{f}(x)$ and $y = \mathrm{f}^{-1}(x)$, stating the coordinates of the points where the curves meet the coordinate axes. State the equations of any asymptotes. Label your curves. [4]



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A function g is such that $g(x) = x^{\frac{3}{2}} + 4, \quad x \geqslant 0.$

(d) Find the exact solution of the equation $gf(x) = 12.$ [4]