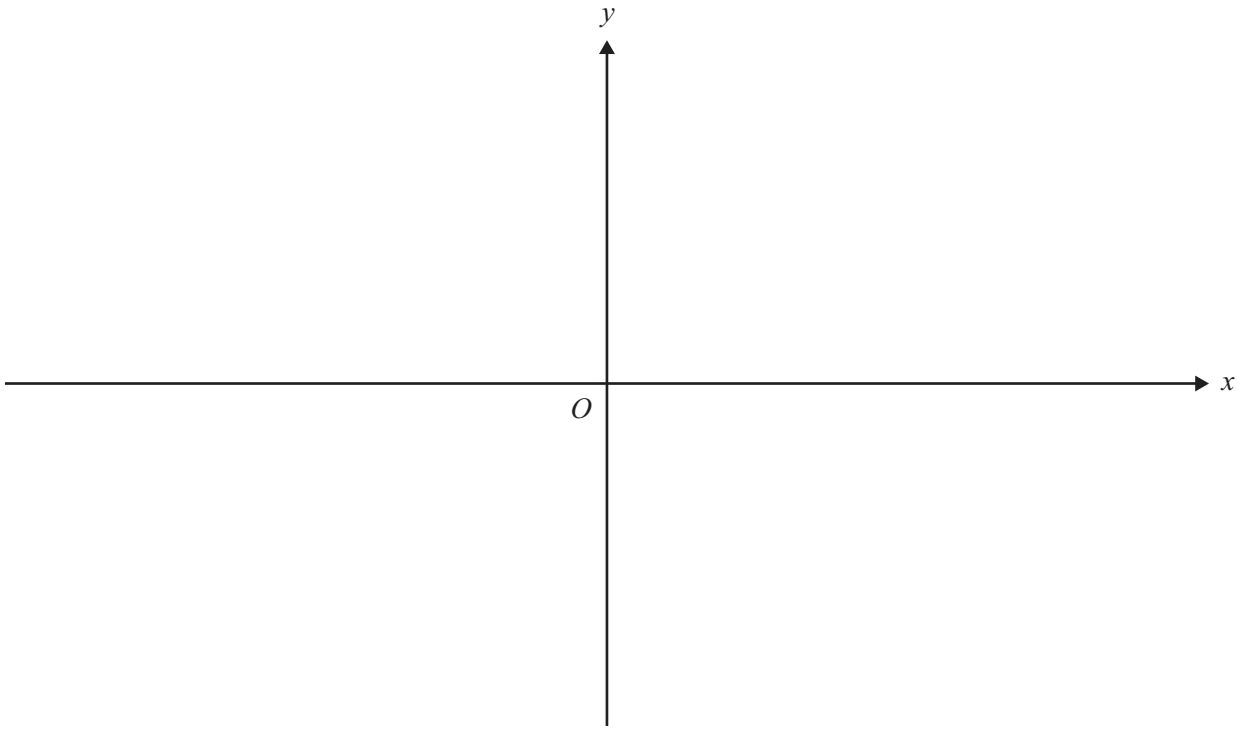
Question 3

A function f is defined by the rule $f(x) = \log_e(5 - x) + 1$.

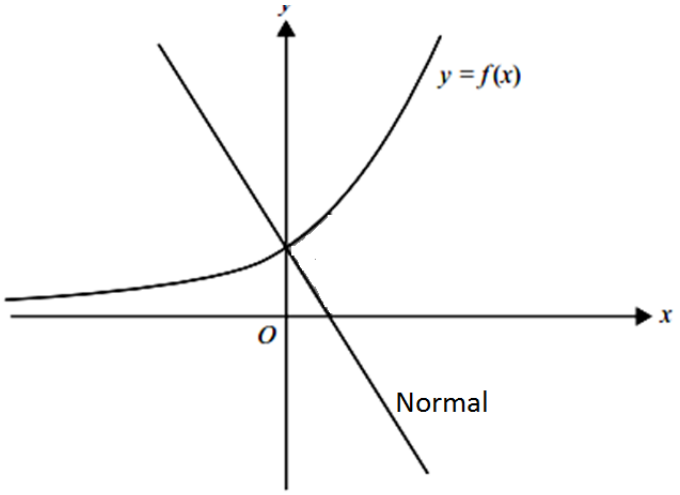
a. Sketch the graph of f over its maximal domain on the axes below. Clearly label any intersections **with the axes with their exact coordinates** and any asymptotes **with their equations**.



b. Find the rule for the inverse function f^{-1}.

3 + 2 = 5 marks

The graph of $f: R \to R, f(x) = e^{\frac{x}{2}} + 1$ is shown. The normal to the graph of f where it crosses the y- axis is also shown.



a. Find the equation of the **normal** to the graph of f where it crosses the y-axis.

2 marks

Question 8

Let $f: R \to R, f(x) = e^x + k$, where k is a real number. The tangent to the graph of f at the point where $x = a$ passes through the point (0, 0). Find the value of k in terms of a.

3 marks