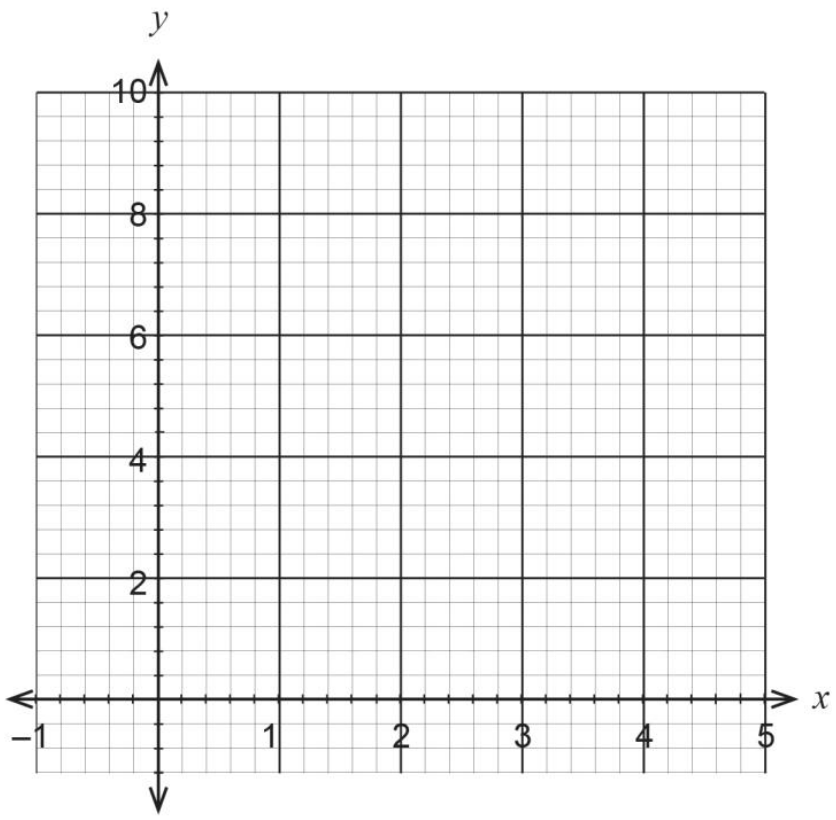
Question 13 **(10 marks)**

(a) Determine $\frac{d}{dx}(x^2 \ln x)$. (2 marks)

(b) Using your answer from part (a), show that the graph of $y = x^2 \ln x$ has only one stationary point. (3 marks)

(c) Sketch the graph of $y = x^2 \ln x$, showing all features. (3 marks)



(d) Calculate the area bounded by the graph of $y = x^2 \ln x$, the x axis, $x = 1$ and $x = e$. (2 marks)