13.

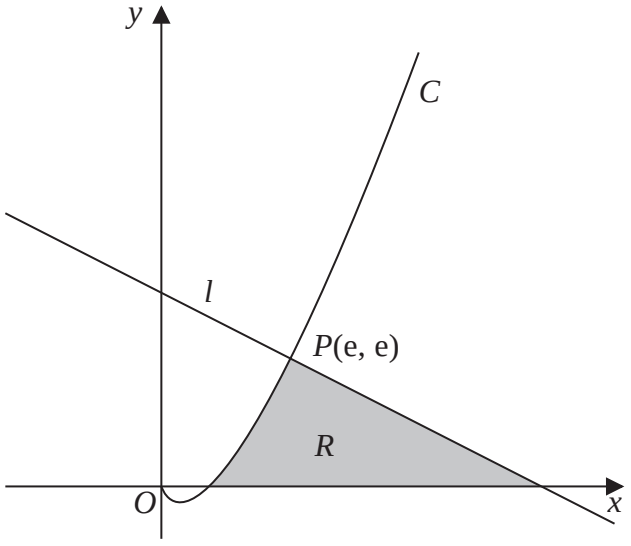

Figure 2

Figure 2 shows a sketch of part of the curve C with equation $y = x \ln x, \quad x > 0$

The line l is the normal to C at the point $P(e, e)$

The region R, shown shaded in Figure 2, is bounded by the curve C, the line l and the x-axis.

Show that the exact area of R is $Ae^2 + B$ where A and B are rational numbers to be found.

(10)