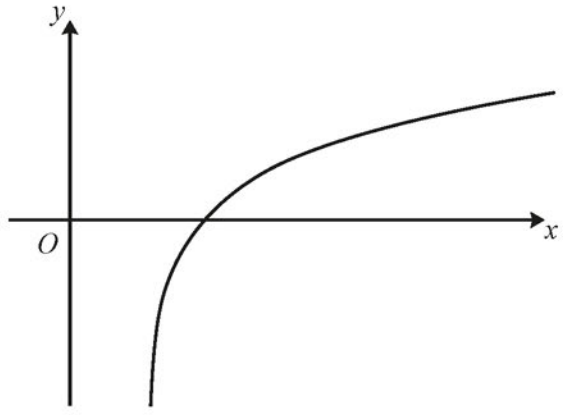
11



The diagram shows part of the curve $y = \ln(x-4)$.

(a) Use integration by parts to show that $\int \ln(x-4)\,dx = (x-4)\ln|x-4| - x + c$. **[5]**

(b) State the equation of the vertical asymptote to the curve $y = \ln(x-4)$. **[1]**

(c) Find the total area enclosed by the curve $y = \ln(x-4)$, the x-axis and the lines $x = 4.5$ and $x = 7$. Give your answer in the form $a\ln 3 + b\ln 2 + c$ where a, b and c are constants to be found. **[4]**