7 The first three terms of an arithmetic progression can be written as

$$2\ln\left(x^3\right), \quad 5\ln\left(x^2\right), \quad 2\ln\left(x^7\right).$$

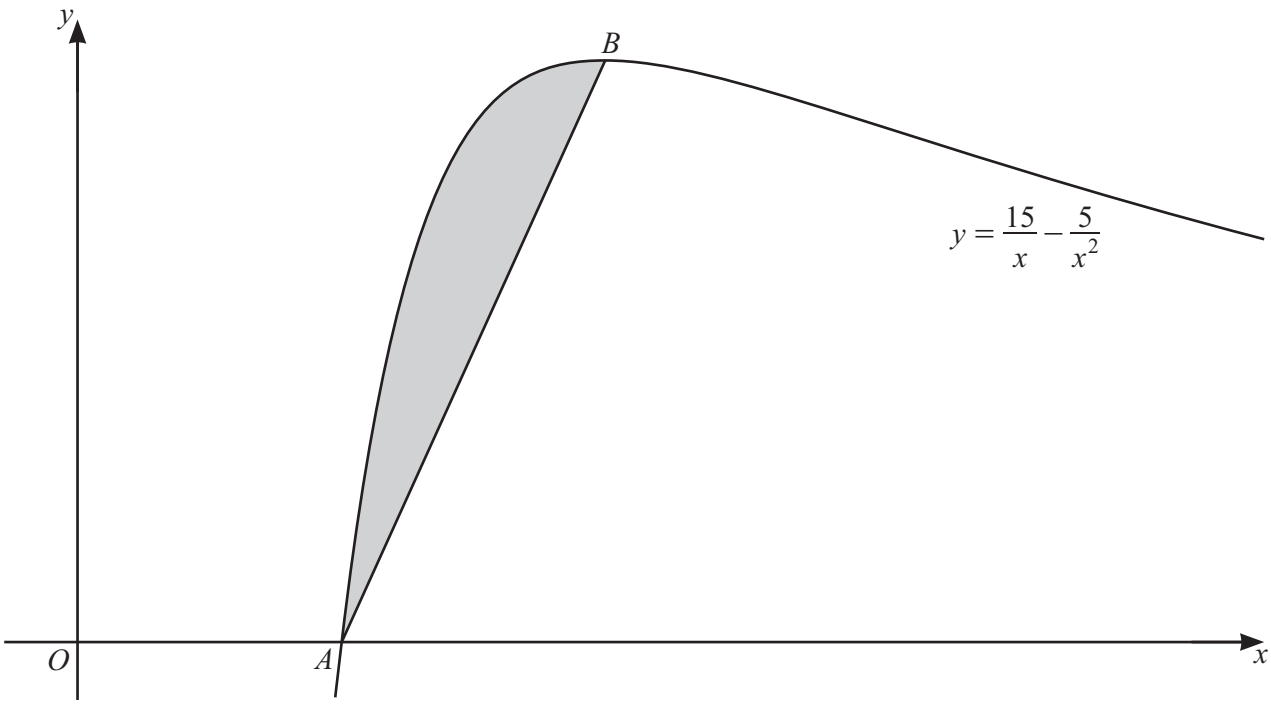
(a) Given that $x > 1$, find the least number of terms for the sum of this progression to be greater than $43\ln\left(x^{24}\right)$. [6]

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(b) Given that the 25th term of this progression is equal to 408, find the exact value of x. [3]

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8



The diagram shows part of the curve $y = \frac{15}{x} - \frac{5}{x^2}$.

The curve meets the x-axis at the point A.
The curve has a maximum at the point B.

Find the area of the shaded region enclosed by the line AB and the curve.

Give your answer in exact form. [11]

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