6 The volume, V, of a sphere is increasing at the constant rate of $2\pi\,\text{cm}^3\,\text{s}^{-1}$.
Find the rate of change of the surface area, S, of this sphere when the volume of the sphere is $36\pi\,\text{cm}^3$.
[6]

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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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