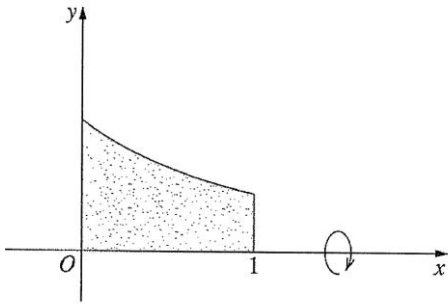


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12	14b	<p>The diagram shows the region bounded by $y = \frac{3}{(x+2)^2}$, the x-axis, the y-axis, and the line $x = 1$. The region is rotated about the x-axis to form a solid. Find the volume of the solid.</p> 	3
$ \begin{aligned} V &= \pi \int_0^1 y^2 dx \\ &= \pi \int_0^1 \left(\frac{3}{(x+2)^2} \right)^2 dx \\ &= \pi \int_0^1 \frac{9}{(x+2)^4} dx \\ &= 9\pi \int_0^1 (x+2)^{-4} dx \\ &= 9\pi \left[\frac{(x+2)^{-3}}{-3} \right]_0^1 \end{aligned} $		$ \begin{aligned} &= -3\pi \left[\frac{1}{(x+2)^3} \right]_0^1 \\ &= -3\pi \left[\frac{1}{27} - \frac{1}{8} \right] \\ &= -3\pi \left[\frac{-19}{216} \right] \\ &= \frac{19\pi}{72} \\ \therefore \text{volume is } \frac{19\pi}{72} \text{ units}^3 \end{aligned} $	<p>State Mean: 1.67/3</p>

* These solutions have been provided by [projectmaths](#) and are not supplied or endorsed by the Board of Studies

Board of Studies: Notes from the Marking Centre

Many candidates correctly stated $V = \pi \int_0^1 \left\{ \frac{3}{(x+2)^2} \right\}^2 dx$, but most omitted the dx .

Omitting π was not a common error.

In many responses, candidates were unable to find the primitive. The most common error involved attempting to use logarithms in the primitive or to obtain a primitive involving $(x+5)^{-5}$.

Source: http://www.boardofstudies.nsw.edu.au/hsc_exams/