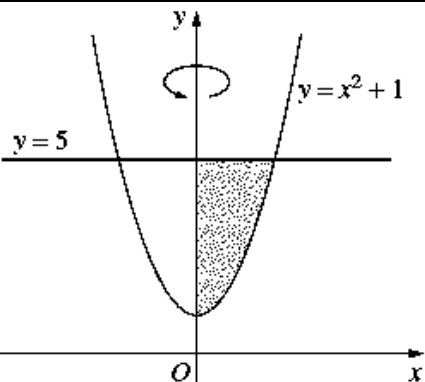


06	4b	<p>In the diagram, the shaded region is bounded by the parabola $y = x^2 + 1$, the y-axis and the line $y = 5$.</p> <p>Find the volume of the solid formed when the shaded region is rotated about the y-axis.</p>	
<p> $y = x^2 + 1$ $\therefore x^2 = y - 1$ </p> <p>Volume = $\pi \int x^2 dy$</p> $= \pi \int_1^5 y - 1 dy$ $= \pi \left[\frac{y^2}{2} - y \right]_1^5$ $= \pi \left[\frac{25}{2} - 5 - \left(\frac{1}{2} - 1 \right) \right]$ $= \pi \left[\frac{15}{2} - \left(-\frac{1}{2} \right) \right]$ <p>\therefore volume of 8π unit³</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

Most candidates were able to answer this volume question correctly. Common errors were leaving out the π in the integrand and incorrect limits. Since this volume of rotation is about the y -axis, the correct integrand is $V = \pi \int_1^5 (y - 1) dy$; however, many candidates took the volume of rotation to be about the x -axis and ended with an incorrect expression.

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