5.3) Adding and subtracting volumes

Worked example	Your turn
A finite region is bounded by the curve with equation $y = x^3 + 1$, the line $y = 3 - x$ and the x and y-axes. A solid is created by rotating the region 360° about the x-axis. Find the volume of this solid.	A finite region is bounded by the curve with equation $y = x^3 + 2$, the line $y = 5 - 2x$ and the x and y-axes. A solid is created by rotating the region 360° about the x-axis. Find the volume of this solid. $$\frac{135\pi}{14}$$

Worked example

A finite region is bounded by the curves with equations $y = \sqrt{x}$ and $y = \dfrac{1}{27x}$ and the line $x = 2$. The region is rotated through $360°$ about the x-axis. Find the exact volume of the solid generated.

Your turn

A finite region is bounded by the curves with equations $y = \sqrt{x}$ and $y = \dfrac{1}{8x}$ and the line $x = 1$. The region is rotated through $360°$ about the x-axis. Find the exact volume of the solid generated.

$$\dfrac{27\pi}{64}$$

Worked example	Your turn
The area between the lines with equations $y = x$ and $y = \sqrt{x}$, where $x \geq 0$ is rotated 360° about the x-axis. Determine the volume of the solid generated.	The area between the lines with equations $y = x$ and $y = \sqrt[3]{x}$, where $x \geq 0$ is rotated 360° about the x-axis. Determine the volume of the solid generated. $$\dfrac{4\pi}{15}$$