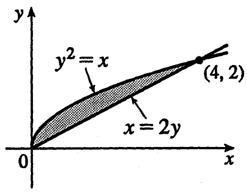
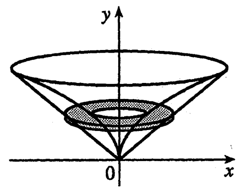
7. A cross-section is a washer with inner radius y^2 and outer radius $2y$, so its area is
$A(y) = \pi(2y)^2 - \pi\left(y^2\right)^2 = \pi\left(4y^2 - y^4\right)$.

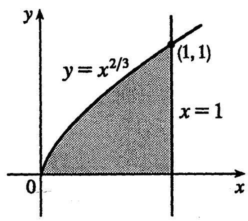
$$V = \int_0^2 A(y)\,dy = \pi\int_0^2\left(4y^2 - y^4\right)dy = \pi\left[\tfrac{4}{3}y^3 - \tfrac{1}{5}y^5\right]_0^2 = \pi\left(\tfrac{32}{3} - \tfrac{32}{5}\right) = \tfrac{64\pi}{15}$$

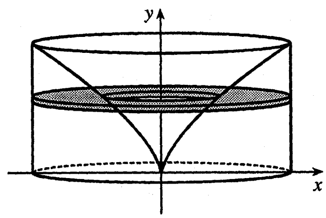




8. $y = x^{2/3} \;\Leftrightarrow\; x = y^{3/2}$, so a cross-section is a washer with inner radius $y^{3/2}$ and outer radius 1, and its area is
$A(y) = \pi(1)^2 - \pi\left(y^{3/2}\right)^2 = \pi\left(1 - y^3\right)$.

$$V = \int_0^1 A(y)\,dy = \pi\int_0^1\left(1 - y^3\right)dy = \pi\left[y - \tfrac{1}{4}y^4\right]_0^1 = \tfrac{3}{4}\pi$$





9. A cross-section is a washer with inner radius $1 - \sqrt{x}$ and outer radius $1 - x$, so its area is
$A(x) = \pi(1-x)^2 - \pi(1-\sqrt{x})^2 = \pi\left[\left(1 - 2x + x^2\right) - \left(1 - 2\sqrt{x} + x\right)\right] = \pi\left(-3x + x^2 + 2\sqrt{x}\right)$.

$$\begin{aligned} V &= \int_0^1 A(x)\,dx = \pi\int_0^1\left(-3x + x^2 + 2\sqrt{x}\right)dx \\ &= \pi\left[-\tfrac{3}{2}x^2 + \tfrac{1}{3}x^3 + \tfrac{4}{3}x^{3/2}\right]_0^1 = \pi\left(-\tfrac{3}{2} + \tfrac{5}{3}\right) = \tfrac{\pi}{6} \end{aligned}$$