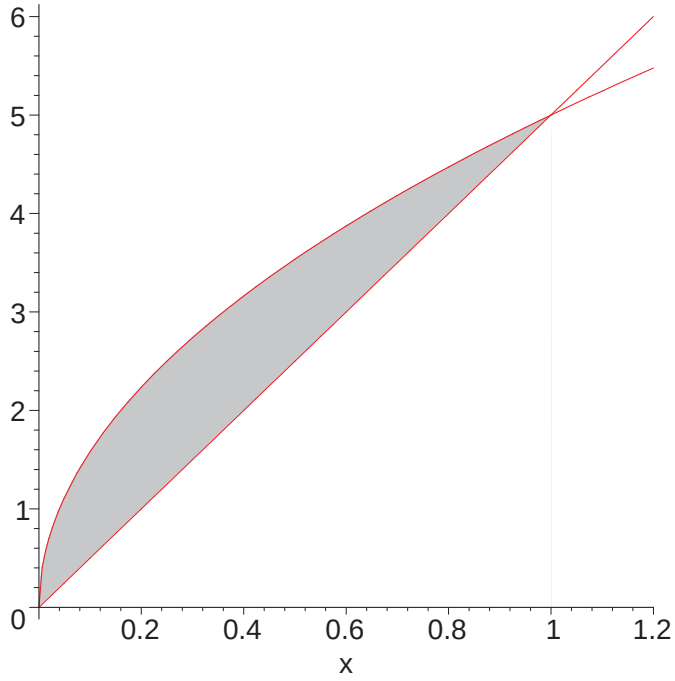
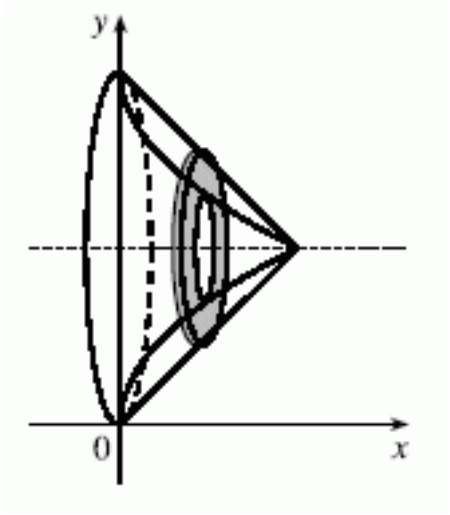
A cross-section is a washer with inner radius $5-5\sqrt{x}$ and outer radius $5-5x$, so its area is

$$\begin{aligned} A(x) &= \pi(5-5x)^2 - \pi\big(5-5\sqrt{x}\,\big)^2 \\ &= 25\pi\big[(1-2x+x^2)-\big(1-2\sqrt{x}+x\big)\big] \\ &= 25\pi\big(-3x+x^2+2\sqrt{x}\,\big). \end{aligned}$$

$$\begin{aligned} V &= \int_0^1 A(x)\,dx = 25\pi\int_0^1 \left(-3x+x^2+2\sqrt{x}\,\right)dx \\ &= 25\pi\big[-\tfrac{3}{2}x^2+\tfrac{1}{3}x^3+\tfrac{4}{3}x^{3/2}\big]_0^1 = 25\pi\big(-\tfrac{3}{2}+\tfrac{5}{3}\big) = \tfrac{25}{6}\pi \end{aligned}$$

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