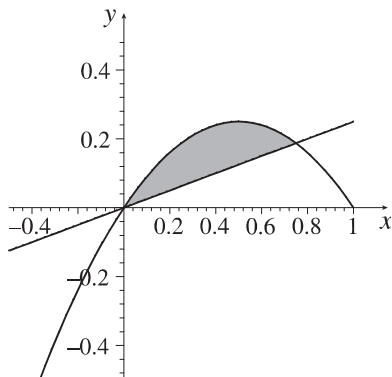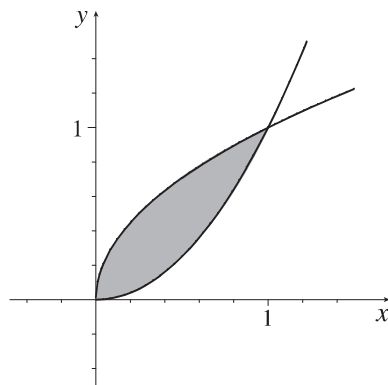# Fun with Double Integration

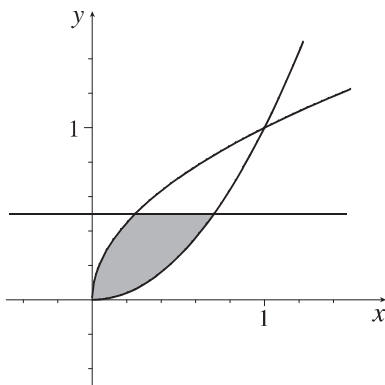**1.** Write double integrals that represent the following areas.

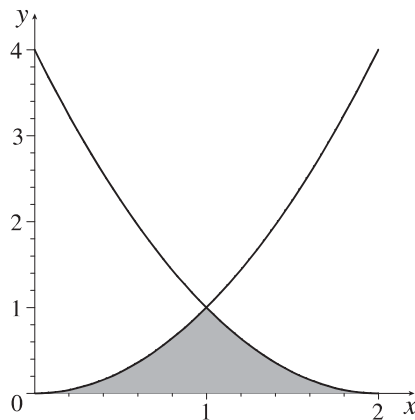(a) The area enclosed by the curve $y = x - x^2$ and the line $y = \dfrac{x}{4}$

(b) The area enclosed by the curves $y = \sqrt[4]{x}$ and $\sqrt{y} = x$

(c) The area enclosed by the curves $y = \sqrt{x}$ and $\sqrt[4]{y} = x$, and the line $y = \frac{1}{2}$

(d) The area enclosed by the curves $y = x^2$ and $y = (x - 2)^2$, and the line $y = 0$

2. What solid region of $\mathbb{R}^3$ do you think is represented by $\int_{-1}^{1} \int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} \sqrt{1 - x^2 - y^2}\, dy\, dx$?