Solution (#1483) If we substitute $1 - x^4 = t$ then $-4x^3\,\mathrm{d}x = \mathrm{d}t$ and our integral becomes

$$\int_0^1 \frac{\mathrm{d}x}{\sqrt{1-x^4}} = \int_1^0 \frac{1}{\sqrt{t}} \left(-\frac{\mathrm{d}t}{4\,(1-t)^{3/4}} \right) = \frac{1}{4} \int_0^1 \frac{\mathrm{d}t}{\sqrt{t}\,(1-t)^{3/4}} = \frac{1}{4} B\left(\frac{1}{2}, \frac{1}{4} \right).$$