# ESERCIZIO 1

$$\int x^n dx = \frac{x^{n+1}}{n+1} + k$$

$$\int x^3 dx = \frac{x^4}{4} + k$$

$$\int \sqrt{x}\, dx = \int x^{\frac{1}{2}} dx = \frac{x^{\frac{1}{2}+1}}{\frac{1}{2}+1} + k = \frac{x^{\frac{3}{2}}}{\frac{3}{2}} + k = \frac{2}{3}\sqrt{x^3} + k =$$

$$= \frac{2}{3} x \sqrt{x} + k$$

$$D\left(\frac{2}{3} x \sqrt{x} + k\right) = \frac{2}{3}\left(1\sqrt{x} + x\,\frac{1}{2} x^{\frac{1}{2}-1}\right) =$$

$$\frac{2}{3}\sqrt{x} + \frac{1}{3}\frac{x}{\sqrt{x}} = \frac{2}{3}\sqrt{x} + \frac{1}{3}\sqrt{x} = \sqrt{x}$$