

$$\int x \sqrt{1-x^2} dx =$$

INT-S1-001

$$\text{TIPPO: } \int f'(x) f(x)^n dx = \frac{1}{n+1} f(x)^{n+1} + k$$

$$= \int x (1-x^2)^{\frac{1}{2}} dx =$$

$$\text{SOSTITUZIONE: } 1-x^2 = z$$

NON ESPlicito x

$$z = 1-x^2$$

$$z' = \frac{dz}{dx} = -2x$$

$$dx = \frac{1}{-2x} dz$$

$$= \int \cancel{x} (z)^{\frac{1}{2}} \frac{1}{\cancel{-2x}} dz =$$

$$= -\frac{1}{2} \int z^{\frac{1}{2}} dz =$$

$$= -\frac{1}{2} \frac{1}{\frac{1}{2}+1} z^{\frac{1}{2}+1} + k =$$

$$= -\frac{1}{2} \cdot \frac{2}{3} z^{\frac{3}{2}} + k =$$

$$= \boxed{-\frac{1}{3} (1-x^2)^{\frac{3}{2}} + k}$$