

### Integrale richiesto

Calcoliamo  $\int \frac{1}{\sqrt{1+x^2}} dx$

Poniamo:

$$\sqrt{1+x^2} = t - x \rightarrow 1+x^2 = t^2 - 2tx + x^2 \rightarrow x = \frac{t^2-1}{2t} \rightarrow dx = \frac{t^2+1}{2t^2}$$

Sostituendo si ha:

$$\int \frac{1}{t - \left(\frac{t^2-1}{2t}\right)} \cdot \frac{t^2+1}{2t^2} dt = \int \frac{1}{\frac{2t^2-t^2+1}{2t}} \cdot \frac{t^2+1}{2t^2} dt = \int \frac{2t}{t^2+1} \cdot \frac{t^2+1}{2t^2} dt = \int \frac{1}{t} dt = \ln|t| + c$$

$$\int \frac{1}{\sqrt{1+x^2}} dx = \ln|x + \sqrt{1+x^2}| + c$$

