

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

INT-S1-024

SOSTITUZIONE:  $e^x - 1 = z$

$$e^x = z + 1$$

$$x = \ln(z + 1)$$

$$\frac{dx}{dz} = \frac{1}{z + 1}$$

$$dx = \frac{1}{z + 1} dz$$

$$= \int \sqrt{z} \frac{1}{z + 1} dz =$$

SOSTITUZIONE  $\sqrt{z} = t$

NON ESPlicito

$$t' = \frac{dt}{dz} = \frac{1}{2\sqrt{z}}$$

$$dz = 2\sqrt{z} dt$$

$$= \int t \frac{1}{t^2 + 1} 2t dt =$$

$$= \int \frac{2t^2}{t^2 + 1} dt = 2 \int \frac{t^2 + 1 - 1}{t^2 + 1} dt = 2 \int \frac{t^2 + 1}{t^2 + 1} - 2 \int \frac{1}{t^2 + 1} dt =$$

$$= 2 \int 1 dt - 2 \int \frac{1}{t^2 + 1} dt =$$

$$= 2t - 2 \arctg t + k = 2\sqrt{z} - 2 \arctg \sqrt{z} + k =$$

$$= \boxed{2\sqrt{e^x - 1} - 2 \arctg \sqrt{e^x - 1} + k}$$