

$$\int e^x \ln(1+e^x) dx =$$

INT-S1-031

SOSTITUZIONE: $1+e^x = z$

$$e^x = z-1$$

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

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

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

$$= \int \cancel{(z-1)} (\ln z) \frac{1}{\cancel{(z-1)}} dz =$$

$$= \int \ln z dz = \quad \text{PER PARTI}$$

$$= \int 1 \cdot \ln z dz = [\int 1] \cdot \ln z - \int [\int 1] [D \ln z] dz =$$

$$= z \ln z - \int z \frac{1}{z} dz =$$

$$= z \ln z - \int dz =$$

$$= z \ln z - z + k =$$

$$= \boxed{(1+e^x) \ln(1+e^x) - (1+e^x) + k}$$