

Answer on Question #72661 - Math / Calculus

Question. Find anti-derivative of $(1 + e^x)/(1 - e^x)$.

Answer:

$$\begin{aligned}\int \frac{1 + e^x}{1 - e^x} dx &= \int \left(1 + \frac{2e^x}{1 - e^x} \right) dx \\&= \int 1 dx + \int \frac{2e^x}{1 - e^x} dx \\&\quad \left[\begin{array}{l} \text{Substitution in 2nd integral:} \\ z = e^x, \quad dz = e^x dx \end{array} \right] \\&= x + \int \frac{2}{1 - z} dz \\&= x - 2 \ln |1 - z| + C \\&= \boxed{x - 2 \ln |1 - e^x| + C}.\end{aligned}$$

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