

Evaluate $\int \frac{e^x}{\sqrt{4-e^{2x}}} dx$

$$I = \int \frac{e^x}{\sqrt{4-e^{2x}}} dx = \int \frac{e^x}{\sqrt{2^2-(e^x)^2}} dx$$

Let $e^x = t$ then, $e^x dx = dt$

$$\begin{aligned} \therefore I &= \int \frac{dt}{\sqrt{4-t^2}} = \int \frac{dt}{\sqrt{2^2-t^2}} \\ &= \sin^{-1} \left(\frac{t}{2} \right) + C = \sin^{-1} \left(\frac{e^x}{2} \right) + C \end{aligned}$$