

Evaluate:  $\int \frac{\cos 2x}{(e^{-x} + \cos x)\sqrt{(\cos x + \sin x)^2}} dx$

$$\int \frac{\cos 2x}{(e^{-x} + \cos x)\sqrt{(\cos x + \sin x)^2}} dx$$

$$= \int \frac{\cos^2 x - \sin^2 x}{(e^{-x} + \cos x)\sqrt{(\cos x + \sin x)^2}} dx$$

$$= \int \frac{\cos x - \sin x}{(e^{-x} + \cos x)} dx$$

$$= \int \frac{e^x(\cos x - \sin x)}{1 + e^x \cos x} dx$$

$$= \int \frac{(1 + e^x \cos x)'}{1 + e^x \cos x} dx$$

$$= \log_e |1 + e^x \cos x| + c$$