Problemă pentru clasa a XII-a

Calculați $I=\int_0^{\pi/2}\frac{\sin x+\cos^2 x}{\cos x+e^{\sin x}}dx$

Soluție Autor Constantin Rusu

Avem $I=\underbrace{\int_0^{\pi/2}\frac{\cos^2 x+e^{\sin x}\cos x-e^{\sin x}\cos x+\sin x}{\cos x+e^{\sin x}}dx}_{3p}=$

$=\int_0^{\pi/2}\left[\frac{\cos x(\cos x+e^{\sin x})}{\cos x+e^{\sin x}}-\frac{e^{\sin x}\cos x-\sin x}{\cos x+e^{\sin x}}\right]dx=\underbrace{\int_0^{\pi/2}\cos x\,dx-\int_0^{\pi/2}\frac{(\cos x+e^{\sin x})'}{\cos x+e^{\sin x}}dx}_{3p}$

$=\left[\sin x\right]_0^{\pi/2}-\underbrace{\left[\ln(\cos x+e^{\sin x})\right]_0^{\pi/2}=\ln 2}_{1p}$

Barem:

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