ROMANIAN MATHEMATICAL MAGAZINE

Find:

$$\Omega=\int_0^{\frac{\pi}{6}}\frac{cosx}{\sqrt{1+sin^2x}}dx$$

Proposed by Nguyen Hung Cuong-Vietnam

Solution by Daniel Sitaru-Romania

$$\Omega=\int_0^{\frac{\pi}{6}}\frac{cosx}{\sqrt{1+sin^2x}}dx\overset{y=sinx}{=}\int_0^{\frac{1}{2}}\frac{1}{\sqrt{1+y^2}}dy=$$

$$=ln\left(\frac{1}{2}+\sqrt{1+\frac{1}{4}}\right)-ln\left(0+\sqrt{1+0}\right)=ln\left(\frac{1+\sqrt{5}}{2}\right)$$