Problem #7

April 8, 2012

Difficulty: medium
Prerequisite: Elementary integration and trigonometry (Calculus I)

Show that the integral

$$\int_0^{\pi/2} \frac{\sin^n(x)}{\sin^n(x) + \cos^n(x)}\, \mathrm{d}x, \quad n = 0, 1, 2 \ldots$$

does not depend on n and find its value.