4. 分部积分

December 13, 2017

5. 求$I = \int_0^{\pi} \frac{x \sin x}{1 + \cos^2 x} dx$.

6. 求$I_n = \int_0^{\frac{\pi}{2}} \sin^n x dx$, ($n$：非负整数)

$$\int_0^{\frac{\pi}{2}} \cos^n x dx = \int_0^{\frac{\pi}{2}} \sin^n x dx = \begin{cases} \frac{(n-1)!!}{n!!}\frac{\pi}{2} & n \text{ even} \\ \frac{(n-1)!!}{n!!} & n \text{ odd} \end{cases}$$

7. 求$\int_{-\pi}^{\pi} \cos^8(\frac{x}{2})dx$