Answer on Question #65678 – Math – Calculus

Evaluate the integral $\int \frac{dx}{2+\cos x}$

Solution.

$$\int \frac{dx}{2 + \cos x}$$

Classical change:

$$\cos x = \frac{1 - t^2}{1 + t^2}$$

$$tg\frac{x}{2} = t$$

$$\alpha x = \frac{2dt}{1 + t^2}$$

$$\int \frac{2dt}{(1 + t^2)(2 + \frac{1 - t^2}{1 + t^2})} = \int \frac{2dt}{t^2 + 3} = \frac{2}{\sqrt{3}} arctg \frac{t}{\sqrt{3}} + C$$

$$\int \frac{dx}{2 + \cos x} = \frac{2}{\sqrt{3}} arctg \frac{tg\frac{x}{2}}{\sqrt{3}} + C = \frac{x}{3} + C$$

Answer: $\frac{x}{3} + C$