

次の不定積分を求めよ。

$$(1) \int \frac{\cos x}{1 + \sin x} dx$$

$$(2) \int \frac{1}{1 + \sin x} dx$$

[基本問題]

$$(1) \quad 1 + \sin x = t \text{ とおき、 } t = \cos x \text{ と}$$

$$\int \frac{\cos x}{1 + \sin x} dx = \log |1 + \sin x| + C$$

$$(2) \quad \int \frac{1}{1 + \sin x} dx = \int \frac{1 - \sin x}{(1 + \sin x)(1 - \sin x)} dx$$

$$= \int \frac{1 - \sin x}{1 - \sin^2 x} dx = \int \frac{1 - \sin x}{\cos^2 x} dx$$

$$= \int \frac{1}{\cos^2 x} dx - \int \frac{\sin x}{\cos^2 x} dx$$

$$= \tan x - \frac{1}{\cos x} + C$$

$$\tan' x = \frac{\cos^2 x + \sin^2 x}{\cos^2 x} = \frac{1}{\cos^2 x}$$