

例題 6 やめるもんなり.

$$\int \sin^2 x \, dx$$

× ㄣ

$$\cos 2x = 1 - 2\sin^2 x$$

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

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

$$= \frac{1}{2}x - \frac{1}{4}\sin 2x + C$$

例題 6 やって対な.

$$\int \cos 3x \sin 5x \, dx$$

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$$\sin 5x \cos 3x + \cos 5x \sin 3x = \sin(5x + 3x)$$

$$+ \sin 5x \cos 3x - \cos 5x \sin 3x = \sin(5x - 3x)$$

$$2\sin 5x \cos 3x = \sin 8x + \sin 2x$$

$$\therefore \sin 5x \cos 3x = \frac{\sin 8x + \sin 2x}{2}$$

$$\left(\frac{5}{2}\right) = \frac{1}{2} \int (\sin 8x + \sin 2x) \, dx$$

$$= -\frac{1}{16}\cos 8x - \frac{1}{4}\cos 2x + C$$

例題 7

$$\int \sin^3 x \, dx$$

× 无 (3倍角)

$$\sin 3x = 3\sin x - 4\sin^3 x$$

$$\therefore \sin^3 x = \frac{3\sin x - \sin 3x}{4}$$

$$\left(\frac{5}{7} \text{式} \right) = \int \frac{3\sin x - \sin 3x}{4} \, dx$$

$$= -\frac{3}{4} \cos x + \frac{1}{12} \sin 3x + C$$