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$$(4) \int \sin 3x \cos 2x \, dx$$

$$= \int \frac{1}{2} \{ \sin(3x+2x) + \sin(3x-2x) \} \, dx$$

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

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

$$= \frac{1}{2} \left( -\frac{1}{5} \cos 5x - \cos x \right) + C$$

$$= -\frac{1}{10} \cos 5x - \frac{1}{2} \cos x + C$$

(Cは積分定数)

$$(5) \int \cos^4 x \, dx$$

$$= \int (\cos^2 x)^2 \, dx$$

$$= \int \left( \frac{1 + \cos 2x}{2} \right)^2 \, dx$$

$$= \int \frac{1 + 2\cos 2x + \cos^2 2x}{4} \, dx$$

$$= \frac{1}{4} \int (1 + 2\cos 2x + \cos^2 2x) \, dx$$

$$= \frac{1}{4} \int \left( 1 + 2\cos 2x + \frac{1 + \cos 4x}{2} \right) \, dx$$

$$= \frac{1}{4} \int \left( 1 + 2\cos 2x + \frac{1}{2} + \frac{1}{2} \cos 4x \right) \, dx$$

$$= \frac{1}{4} \left( x + 2 \cdot \frac{1}{2} \sin 2x + \frac{1}{2} x + \frac{1}{2} \cdot \frac{1}{4} \sin 4x \right) + C$$

$$= \frac{1}{4} x + \frac{1}{4} \sin 2x + \frac{1}{8} x + \frac{1}{32} \sin 4x + C$$

$$= \frac{3}{8} x + \frac{1}{4} \sin 2x + \frac{1}{32} \sin 4x + C$$

(Cは〃)