

3C 複合55

次の不定積分を求めよ。

(1) $\int x \cos 2x dx$

(2) $\int \sqrt[3]{x} \log x dx$

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$$\begin{aligned} \text{d1 } \int x \cos 2x dx &= x \frac{1}{2} \sin 2x - \int \frac{1}{2} \sin 2x dx \\ &= \frac{x}{2} \sin 2x + \frac{1}{4} \cos 2x + C \end{aligned}$$

$$\begin{aligned} \text{d2 } \int x^{\frac{1}{3}} \log x dx &= \frac{3}{4} x^{\frac{4}{3}} \log x - \int \frac{3}{4} x^{\frac{4}{3}} \cdot \frac{1}{x} dx \\ &= \frac{3}{4} x^{\frac{4}{3}} \log x - \frac{3}{4} \int x^{\frac{1}{3}} dx \\ &= \frac{3}{4} x^{\frac{4}{3}} \log x - \frac{3}{4} \cdot \frac{3}{4} x^{\frac{4}{3}} + C \\ &= \frac{3}{16} x^{\frac{4}{3}} (4 \log x - 3) + C \end{aligned}$$