積分の計算 **2012-9-21**

$$\int x^{\square}\,dx = \frac{1}{\square+1}x^{\square+1} \qquad \int \frac{1}{x}\,dx = \log|x|$$

【例題 49】

(1)

$$\int x^5\,dx = \int x^{\square}\,dx = \frac{1}{\square+1}x^{\square+1} = \square + C$$

(2)

$$\int x^{-7}\,dx = \int x^{\square}\,dx = \frac{1}{\square+1}x^{\square+1} = \square + C$$

(3) $\frac{1}{x^3} = x^{\square}$ より

$$\int \frac{1}{x^3}\,dx = \int x^{\square}\,dx = \frac{1}{\square+1}x^{\square+1} = \square + C$$

(4) $\sqrt[5]{x^6} = x^{\square}$ より

$$\int \sqrt[5]{x^6}\,dx = \int x^{\square}\,dx = \frac{1}{\square+1}x^{\square+1} = \square + C$$

(5)

$$\int \left(t^{-1}+\frac{3}{t^4}\right)\,dt = \int (t^{\square}+3t^{\square})\,dt = \square$$

$$= \square + C$$

(6)

$$\int \frac{1}{\sqrt{x}}\,dx = \int x^{\square}\,dx = \frac{1}{\square+1}x^{\square+1} = \square + C$$

☞ (4) や (6) の場合,

$\dfrac{1}{\square+1}x^{\square+1}$ は, $\dfrac{1}{\square+1}$ を計算すると分母の中に分数が出てくるので,

先に $x^{\square+1}$ を計算して $\square\, x^{\square+1}$ とする.