

$$\begin{array}{rcl}
 \text{导} & n & n' & u'' & \dots & u^{(n)} & u^{(n+1)} \\
 \text{积} & v^{(n+1)} & v^n & v^{n-1} & \dots & v' & v
 \end{array}
 \begin{array}{l}
 \oplus \\
 \ominus \\
 \oplus \\
 \ominus \\
 \oplus \\
 \ominus
 \end{array}
 \begin{array}{l}
 u' \\
 u'' \\
 \dots \\
 u^{(n)} \\
 u^{(n+1)}
 \end{array}
 \begin{array}{l}
 (-1)^{n+1}
 \end{array}$$

表格积分法

$$\int p_n(x) e^{ax} dx \quad \int a_n(x) \sin bx dx$$

eg. $\int (x^2 + 2x + 3) e^{2x} dx$

$$\begin{array}{rcl}
 \text{导} & x^2 + 2x + 3 & 2x + 2 & 2 & 0 \\
 \text{积} & e^{2x} & \frac{1}{2} e^{2x} & \frac{1}{4} e^{2x} & \frac{1}{8} e^{2x}
 \end{array}
 \begin{array}{l}
 \oplus \\
 \ominus \\
 \oplus \\
 \ominus
 \end{array}$$

$$I = \frac{1}{2} e^{2x} (x^2 + 2x + 3) - \frac{1}{4} e^{2x} (2x + 2) + \frac{1}{4} e^{2x} + C$$

eg. $\int x^2 \cos 3x dx$

$$\begin{array}{rcl}
 \text{导} & x^2 & 2x & 2 & 0 \\
 \text{积} & \cos 3x & \frac{1}{3} \sin 3x & -\frac{1}{9} \cos 3x & -\frac{1}{27} \sin 3x
 \end{array}
 \begin{array}{l}
 \oplus \\
 \ominus \\
 \oplus \\
 \ominus
 \end{array}$$

无法导至0后，导至出现循环为止。

$$\begin{array}{rcl}
 \cos 2x & -2 \sin 2x & -4 \cos 2x \\
 e^{2x} & \frac{1}{2} e^{2x} & \frac{1}{4} e^{2x}
 \end{array}
 \begin{array}{l}
 \oplus \\
 \ominus \\
 \oplus
 \end{array}$$

$$I = \frac{1}{3} x^2 \sin 3x + \frac{2}{9} x \cos 3x - \frac{1}{27} \sin 3x + C$$

eg. $\int_0^a x e^{2x} dx = \frac{1}{4}$, $a = ?$

[2014, 3]

$$\begin{array}{rcl}
 \text{导} & x & 1 & 0 \\
 \text{积} & e^{2x} & \frac{1}{2} e^{2x} & \frac{1}{4} e^{2x}
 \end{array}$$

$$I = \frac{1}{2} x e^{2x} - \frac{1}{4} e^{2x} \Big|_0^a$$

$$a = \frac{1}{2}$$