$$\int \frac{2x+3}{(x-2)(x+5)} = \int\left(\frac{A}{x-2}+\frac{B}{x+5}\right) = \int \frac{Ax+5A+Bx-2B}{(x-2)(x+5)}$$

$$\begin{cases} A+B=2 \\ 5A-2B=3 \end{cases} \quad \begin{matrix} A=1 \\ B=1 \end{matrix}$$

$$\int\left(\frac{1}{(x-2)}+\frac{1}{(x+5)}\right) = \ln|x-2| + \ln|x+5$$

$$\int e^{2x}\cos 3x\,dx$$

$u=e^{2x}$ $\quad du=2e^{2x}dx$

$dv=\cos 3x\,dx$ $\quad v=\frac{1}{3}\sin 3x$

$$e^{2x}\cdot\frac{1}{3}\sin 3x - \frac{2}{3}\int \sin 3x\cdot e^{2x}dx =$$

$u=e^{2x}$ $\quad du=2e^{2x}dx$

$dv=\sin 3x$ $\quad v=-\frac{1}{3}\cos 3x$

$$= \frac{e^{2x}\sin 3x}{3} - \frac{e^{2x}\cos 3x}{3} + \frac{2}{3}\int \cos 3x\, e^{2x}dx$$

$$\frac{7}{3}\int e^{2x}\cos 3x\,dx = \frac{e^{2x}(\sin 3x-\cos 3x)}{7}$$

$$\int_0^{\ln 2} x e^{-x}dx$$

$u=x$ $\quad du=dx$

$dv=e^{-x}dx$ $\quad v=-e^{-x}$

$$e^{-x}\cdot x - \int -e^{-x}dx = -e^{-x}\cdot x - e^{-x} = -e^{-x}(x+1)\Big|_0^{\ln 2}$$

$$-e^{-\ln 2}(\ln 2+1) + e^{0}\cdot\frac{1}{(\ln 0+1)} = -\frac{\ln 2+3}{2}$$

$$f x = \sum_{n=0}^{\infty} \frac{f^{(n)}(0)}{n!}x^n$$

$$y=e^x$$

$$\frac{e^0x^0}{0!} + \frac{ex}{1!} + \frac{e^0x^2}{2!}\dots = \sum\frac{x^n}{n!}$$