$$\int \frac{1}{2} e^{2x} (x-1)\,dx$$

$$\int \frac{1}{2} e^{2x} x (x-1)\,dx$$

$$\frac{1}{2} \times \int e^{2x} x (x-1)\,dx$$

$$\frac{1}{2} \times \int x e^{2x} - e^{2x}\,dx)$$

$$\frac{1}{2} \times \left(\frac{x e^{2x}}{2} \quad \frac{e^{2x}}{4} \quad e\frac{2x}{2} \right)$$

$$\frac{x e^{2x}}{4} - \frac{3e^{2x}}{8}$$

$$\frac{x e^{2x}}{4} - \frac{3e^{2x}}{8} + C$$

$$\int x^2 \ln x \, dx$$

$$\int x^2 \; x \ln(x) \, dx$$

$$\int \ln(x) \cdot x^2 \, dx$$

$u = \ln(x)$

$dv = x^2 \, dx$

$$\int \frac{dx}{\sqrt{5-x^2}} = \text{Arcsen}\,\frac{x}{\sqrt{5}} + c$$

$$\int \frac{dx}{x\sqrt{x^2-5}} = \frac{1}{\sqrt{5}}\,\text{Arcsec}\,\frac{x}{\sqrt{5}} + c$$

$$\int \frac{dx}{4x^2-9} = \quad u^2 = ax^2 \Rightarrow u = 2x \quad \frac{1}{6}\ln\left|\frac{2x-3}{2x+3}\right| + c$$

$$a^2 = 9 \Rightarrow a = 3$$

$$\int \sqrt{16-9x^2}\,dx \qquad a^2 = 16 \Rightarrow a = 4$$

$$u^2 = 9x^2 \Rightarrow u = 3x$$

$$\int (e^x+1)^2\,dx$$

$$\int e^{2x} \csc x\,dx$$

$u = \csc x \quad dv = e^{2x}$

$du = \csc x \cdot \cot x \quad v = \frac{e^{2x}}{2}$

$\frac{1}{2} e^{2x} \csc x - \frac{1}{2}\int e^{2x} \csc$

$-\frac{1}{2}\left(\frac{1}{2}\right)e^{2x} \csc x + c$

$\frac{1}{2} e^{2x} \csc x \left(\frac{1}{2} e^{2x} - \frac{1}{4} e^{2x}\right) \csc x + c$

$\csc x \left(\frac{1}{2} \cdot e^{2x} - \frac{1}{4} e^{2x}\right) + c$

Norma

$\int x^2 e^x \, dx =$ $u = x$ $dv = e^x \, dx$ $du = 2x \, dx$ $v = e^x$

$x^2 e^x - \int e^x \, x \, 2x \, dx$

$x^2 e^x - 2x \int e^x \, x \, dx$

$x^2 e^x - 2x \int x e^x \, dx$

$x^2 e^x - 2(x e^x - \int e^x \, dx)$

$x^2 e^x - 2(x e^x - e^x$

$x^2 e^x - 2x e^x + 2e^x + c$

$$= \int \frac{x^2 - x - 2}{\sqrt{x}}\, dx$$

$$= \int \frac{x^2}{\sqrt{x}} dx - \int \frac{x}{\sqrt{x}} dx - 2 \int \frac{dx}{\sqrt{x}}$$

$$= \int x^2 x^{-1/2} dx - \int x \cdot x^{-1/2} dx - 2 \int x^{-1/2} dx$$

$$= \int x^{3/2} dx - \int x^{1/2} dx - 2 \int x^{-1/2}\, 2x$$

$$= \frac{x}{5/2} - \frac{x^{3/2}}{3/2} - \frac{2x^{1/2}}{\frac{1}{2}} + c$$

$$\frac{2}{5}\sqrt{x^5} - \frac{2}{3}\sqrt{x^3} - 4\sqrt{x} + c$$

$$\int \frac{(1+\sqrt{x})^2}{\sqrt{x}}\,dx$$

$$\int \frac{(x+1)(x-2)}{\sqrt{x}}\,dx$$

$$\int \frac{dx}{x-1} \quad \ln|x-1|+c$$

$$\int a^{2x}\,dx \quad \frac{a^2}{\ln a}+c \quad a>1 \neq 1$$

$$=\int (1+2\sqrt{x}+x)$$

$$=\int \frac{dx}{\sqrt{x}}+2\int \frac{\sqrt{x}}{\sqrt{x}}\,dx+\int \frac{x}{\sqrt{x}}$$

$$=\int x^{1/2}\,dx+2\int dx+\int x^{2/1}\cdot x^{1/2}\,dx$$

$$=\frac{x}{\frac{1}{2}}\ 2\sqrt{x}+2x+\frac{x^{5/2}}{5/2}+c$$

$$=2\sqrt{x}+2x+\frac{x^{5/2}}{5/2}+c$$

$$=2\sqrt{x}+2x+\frac{2}{5}\sqrt{x^5}+c$$

Norma

$$\int \frac{dx}{2x^3} = \frac{1}{2}\int \frac{dx}{x^3} = \frac{1}{2}\int x^{-3}\,dx \quad \frac{x^{-3+1}}{-3+1} = \frac{1}{2}\,\frac{x^{-2}}{-2}$$

$$= \frac{x^{-2}}{-4} \quad \frac{1}{4x^2} + C$$

$$\int \sqrt{2-3x}\,dx = \int (2-3x)^{1/2}\,dx = \frac{(2-3x)^{3/2}}{3/2}$$

$$\int (x+3)^2\,x\,dx$$

$$\int (x+5)^2\,dx = \int (x^2+6x+9)\,x\,dx = \int (x^3+6x^2+9x)\,dx \quad \int x^3\,dx + 6\int x^2\,dx + 9\int x\,dx = \frac{x^4}{4} + 2x^3 + \frac{9x^2}{2} + C$$

$$\int \frac{(x^2+2x+2)}{(x+2)}\,dx = \int x\,dx + 10\int dx + 25\int \frac{dx}{x}$$

$$\frac{x^2}{2} + 10x + 25\ln|x| + C$$

$$\int e^{4x}\,dx = \frac{1}{4}e^{4x} + C$$

$$\int (e^x+2)^2\,dx \quad \frac{1}{2}e^{2x}+4e^x+4x+C$$

$$\int \frac{dx}{e^{-x}} \quad e^x+C$$

$$\int \tan x^2\,dx$$

$$\cancel{\int \frac{dx}{x+x^{1/3}}}$$

$$\int \frac{dx}{x+x^{1/3}} =$$

$$\int \frac{dx}{x+x^{1/3}}$$

$\int x e^x dx =$ $du = dx$ $v = e^x$

$u = x$ $xe^x - \int e^x dx$

$dv = e^x dx$

$xe^x - e^x$

$= xe^x - e^x + C$

$\int x^2 \ln x dx$

$U = nx dx$

$U = \ln x$ $dv = x^2$

$du = \frac{1}{x}$ $dv = x^2$

$v = \frac{x^3}{3}$

$\frac{x^3}{3} \ln x - \int \frac{x^3}{3} \cdot \frac{1}{x} dx$

$- \int \frac{x^3}{3x} dx$ $x^3 \ln x - \frac{1}{3} \frac{x^3}{3} + C$

$- \frac{1}{3} \int \frac{x^3}{x} dx$ $\frac{x^3}{3} \ln x - \frac{x^3}{9} + C$

$- \frac{1}{3} \frac{x}{x} dx$

Norma