

$$\int \frac{dx}{\sqrt{5-x^2}} = \text{ARCSIN} \frac{x}{\sqrt{5}} + C$$

$$\int \frac{dx}{x\sqrt{5}} = \frac{1}{\sqrt{5}} \text{ARCSIN} \frac{x}{\sqrt{5}} + C$$

$$\int \frac{dx}{4x^2-9} = \frac{U^2 - a^2 \rightarrow U=2x \quad \frac{1}{6} \ln \left| \frac{2x-3}{2x+3} \right| + C$$

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

$$\int \sqrt{16-9x^2} dx \quad a^2=16 \rightarrow a=4$$

$U^2=9x^2 \rightarrow U=3x$

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

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

$$U = \csc x \quad dU = -\csc x \cot x dx$$

$$dV = e^{2x} \quad \frac{1}{2} e^{2x}$$

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

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

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

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

$$\int x^2 e^x dx = \frac{u=v}{dv=e^x dx} \quad \frac{du=2x dx}{v=e^x}$$

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

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

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

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

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

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

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

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

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

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

$$\int \frac{(x^2+2x+2) dx}{(x+1)} = \int x dx + \int \frac{1}{x+1} dx = \frac{x^2}{2} + \ln|x+1| + C$$

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