Ex $F = \int 3x^4\,dx = 3\int x^4\,dx = 3\dfrac{x^{4+1}}{4+1} + C$

$F(x) = \dfrac{3x^5}{5} + C$

Ex $\int \sqrt{x}\,dx = \int x^{1/2}\,dx = \dfrac{x^{3/2}}{3/2} + C$

$= \dfrac{2}{3}x^{3/2} + C$

Ex $\int \left(x^{2/3} + \dfrac{4}{x} - 7\right) dx$

$\int \dfrac{dx}{x} = \ln|x| + C$

$= \int x^{2/3}\,dx + \int \dfrac{4}{x}\,dx - \int 7\,dx$

$= \dfrac{x^{5/3}}{5/3} + 4\int \dfrac{dx}{x} - 7\int dx$

$= \dfrac{3}{5}x^{5/3} + 4\ln|x| - 7x + C$

$+C_1 \quad +C_2 \quad +C_3$

Ex $\int 3.5\,dy$ with respect to $y$

$= 3.5y + C$

Ex $\int e^p\,dp = e^p + C$

Ex $\int (x+3)(x-3)\,dx = \int (x^2 - 9)\,dx = \dfrac{x^3}{3} - 9x + C$

$$\frac{d}{dx}\left(\int x^n\,dx\right) \overset{?}{=} \frac{d}{dx}\left(\frac{x^{n+1}}{n+1} + C\right)$$

$$x^n = \frac{(n+1)}{(n+1)} x^{n+1-1} + 0$$

$$= x^n$$

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**Ex** $\int \frac{3}{\sqrt{t}}\,dt = \int 3t^{-1/2}\,dt = 3\int t^{-1/2}\,dt$

$$\frac{3}{t^{1/2}} = \frac{3t^{1/2}}{1/2} + C$$

$$= 6t^{1/2} + C = 6\sqrt{t} + C$$

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Forms

$$\int k\,dx = kx + C, \quad \int dx = x + C$$

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

integrand

$$\int x^{-1}\,dx = \int \frac{dx}{x} = \ln|x| + C$$

integrand

$$\int e^x\,dx = e^x + C$$

$$\int e^{4x}\,dx$$