§5.4 - Indefinite Integrals

$\int_a^b f(x)\,dx$ - Definite Integral ← A number, $F(b)-F(a)$, $F'(x)=f(x)$

$\int f(x)\,dx$ - Indefinite Integral ← A family of functions, $F(x)+C$

Ex: $\int 3e^x + \frac{1}{\sqrt{x}} - \sin(x)\,dx = \int 3e^x + x^{-1/2} - \sin(x)\,dx$

$= 3e^x + \frac{x^{1/2}}{1/2} - -\cos(x) + C = \boxed{3e^x + 2\sqrt{x} + \cos(x) + C}$

Ex: $\int \frac{4}{x} + \frac{x}{4}\,dx = 4\ln|x| + \frac{\frac{1}{2}x^2}{4} + C$

$= \boxed{4\ln|x| + \frac{1}{8}x^2 + C}$