the sum rule

example

(because integral is indefinite)

the sum rule

As with differentiation, we also have a sum rule for integration, that is

$$\int \big(f(x) + g(x)\big)\, dx = \int f(x)dx + \int g(x)dx$$

"the antiderivative of a sum is the sum of the antiderivatives"

we also have that $\int Kf(x)dx = K\int f(x)dx$ where K is a constant

example

$$\int (3x^4 + 2x + 5)dx = \int 3x^4 + \int 2xdx + \int 5dx$$

$$= 3\int x^4 + 2\int xdx + 5\int dx$$

$$= \frac{3}{4}x^5 + \frac{2}{3}x^3 + 5x + C$$ (because integral is indefinite)

the sum rule