

Fundamental Theorem of Calculus

If f is continuous on the interval $[a, b]$ then

$$\int_a^b f(x) dx = F(b) - F(a)$$

Where F is any antiderivative of f

eg1 Evaluate $\int_{-1}^2 x^3 dx = F(2) - F(-1)$

$$= \left[\frac{1}{4} x^4 \right]_{-1}^2$$
$$= \frac{15}{4}$$

eg2 Find $\int_{\pi}^{2\pi} \sin x dx = \left[-\cos x \right]_{\pi}^{2\pi}$

$$= (-\cos 2\pi) - (-\cos \pi)$$
$$= -1 - 1$$
$$= -2$$

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#2 aceg