

10.2 The Fundamental Theorem of Calculus

Indefinite Integral –

$$\int 2x \, dx =$$

Definite Integral –

$$\int_1^3 2x \, dx =$$

$$\int_0^{\frac{\pi}{2}} \cos x \, dx =$$

$$\int_{-2}^1 5z^2 - 7z + 3 \, dz =$$

$$\int_1^4 \frac{8}{\sqrt{t}} - 12\sqrt{t^3} \, dt =$$

Properties of Definite Integrals –

$$\int_a^a f(x) \, dx = 0$$

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

The definite integral of f from a to b is defined by:

$$\int_a^b f(x)dx = \lim_{n \rightarrow +\infty} \sum_{k=1}^n f(x_k)\Delta x$$

The Fundamental Theorem of Calculus (part 1)

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 .

Find the exact area beneath the curve $y = x^2 + 1$ from $x = 0$ to $x = 3$

The Fundamental Theorem of Calculus (part 2) –