

Net area under the curve:

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

Ne zadržat

ch. 5.3

Fundamental theorem of calculus:

f mg - continuous on $[a, b]$

$$A(x) = \int_a^x f(t) dt$$

- area function

1) $A'(x) = \frac{d}{dx} \int_a^x f(t) dt \quad (F'(x))$

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

ch. 5.4

$$\bar{f} = \frac{1}{b-a} \int_a^b f(x) dx$$

- average value of an integrable function

if f is continuous on $[a, b]$:

$$f(c) = \bar{f} = \frac{1}{b-a} \int_a^b f(t) dt$$

integrals

5.5. Substitution rule (reverse chain rule)

If $u = g(x)$ - differentiable function, whose range is Interval I and f is continuous on I, then:

$$\int f(g(x)) \cdot g'(x) dx = \int f(u) du$$

Method:

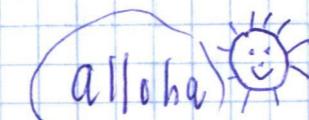
- 1) identify inner function $u = g(x)$, such that a constant multiple of $g'(x)$ appears in the integrand
- 2) Set $u = g(x)$, $du = g'(x)$
- 3) evaluate integral with respect to u
- 4) write results back using $u = g(x)$

definite integrals:

$$\int_a^b f(g(x)) g'(x) dx = \int_{g(a)}^{g(b)} f(u) du$$

one-trip method

round-trip method



Hawaii!!