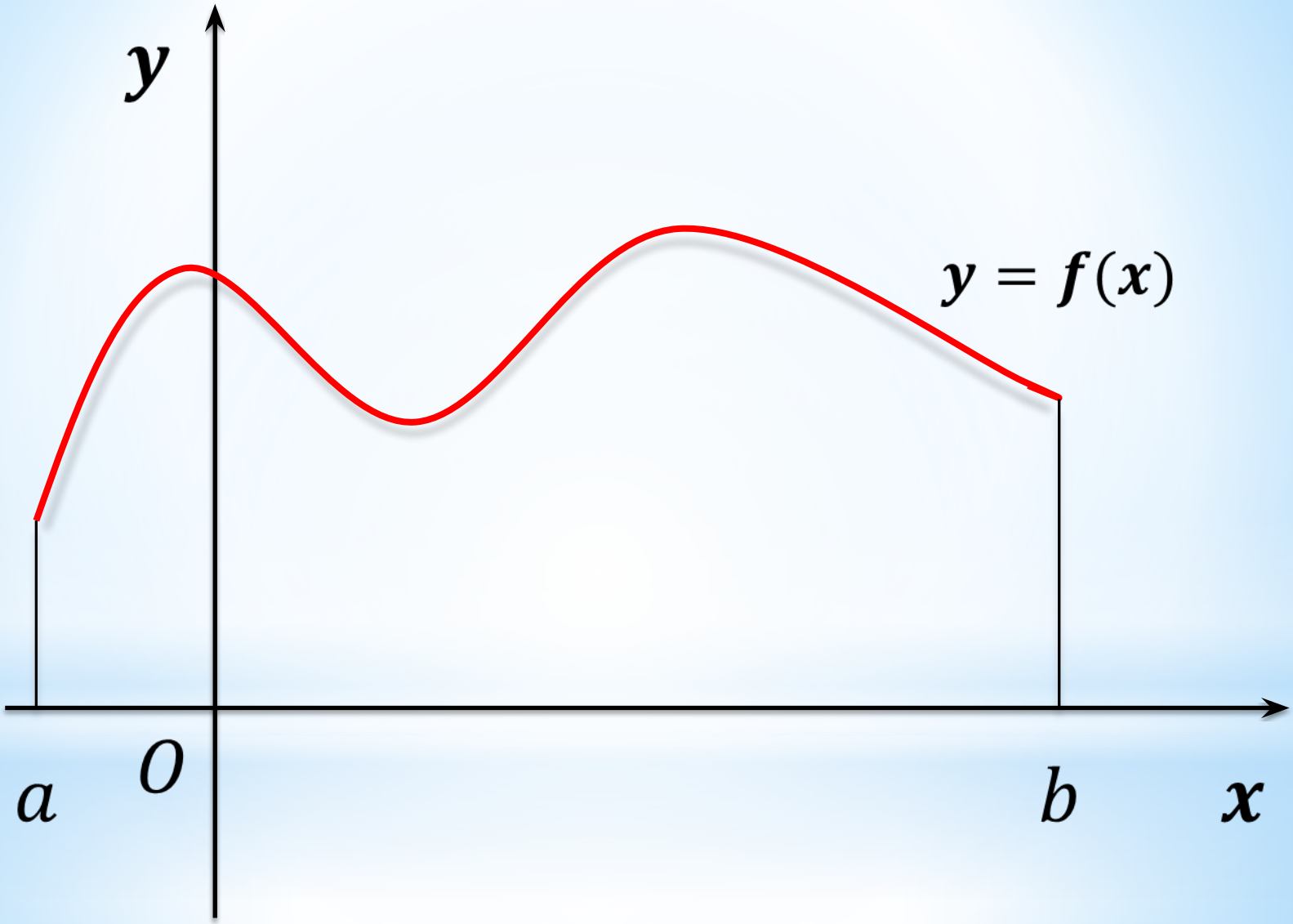
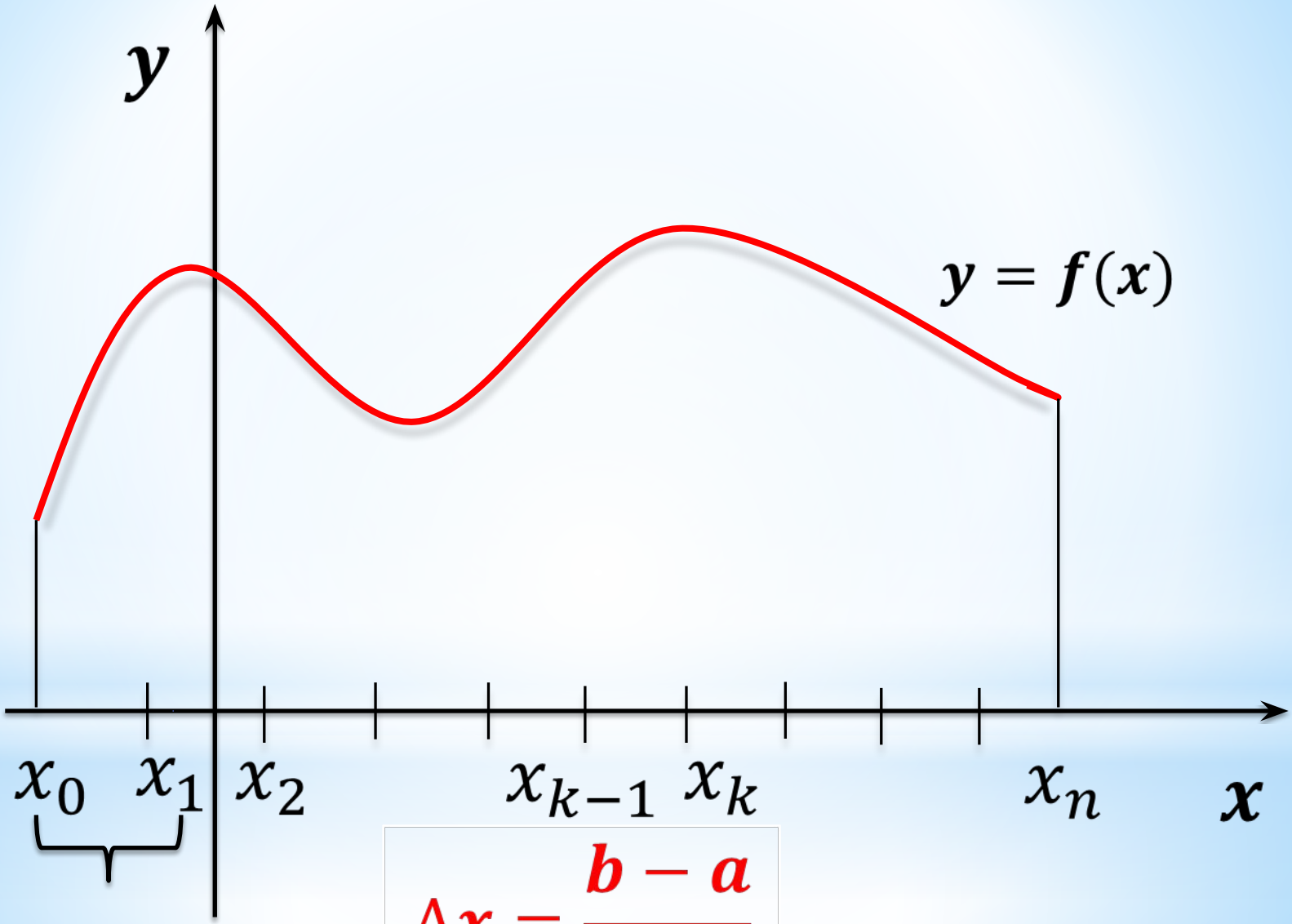
# Интеграл

«Знание только тогда знание, когда оно приобретено усилиями своей мысли, а не памятью»

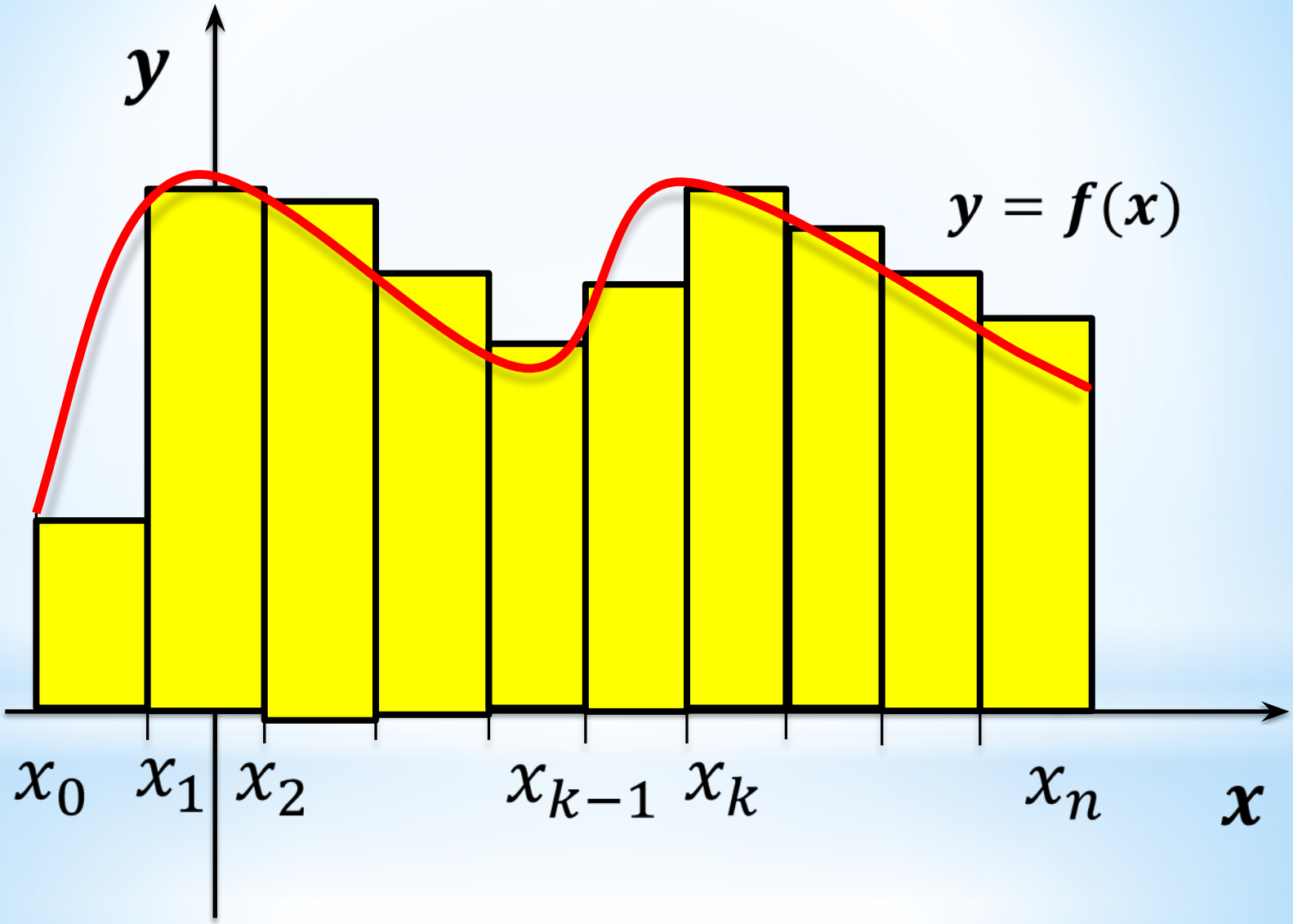
Л.Н. Толстой


y
y = f(x)
a
O
b
x

$$x_0 = a < x_1 < x_2 < \cdots < x_{n-1} < x_n = b$$

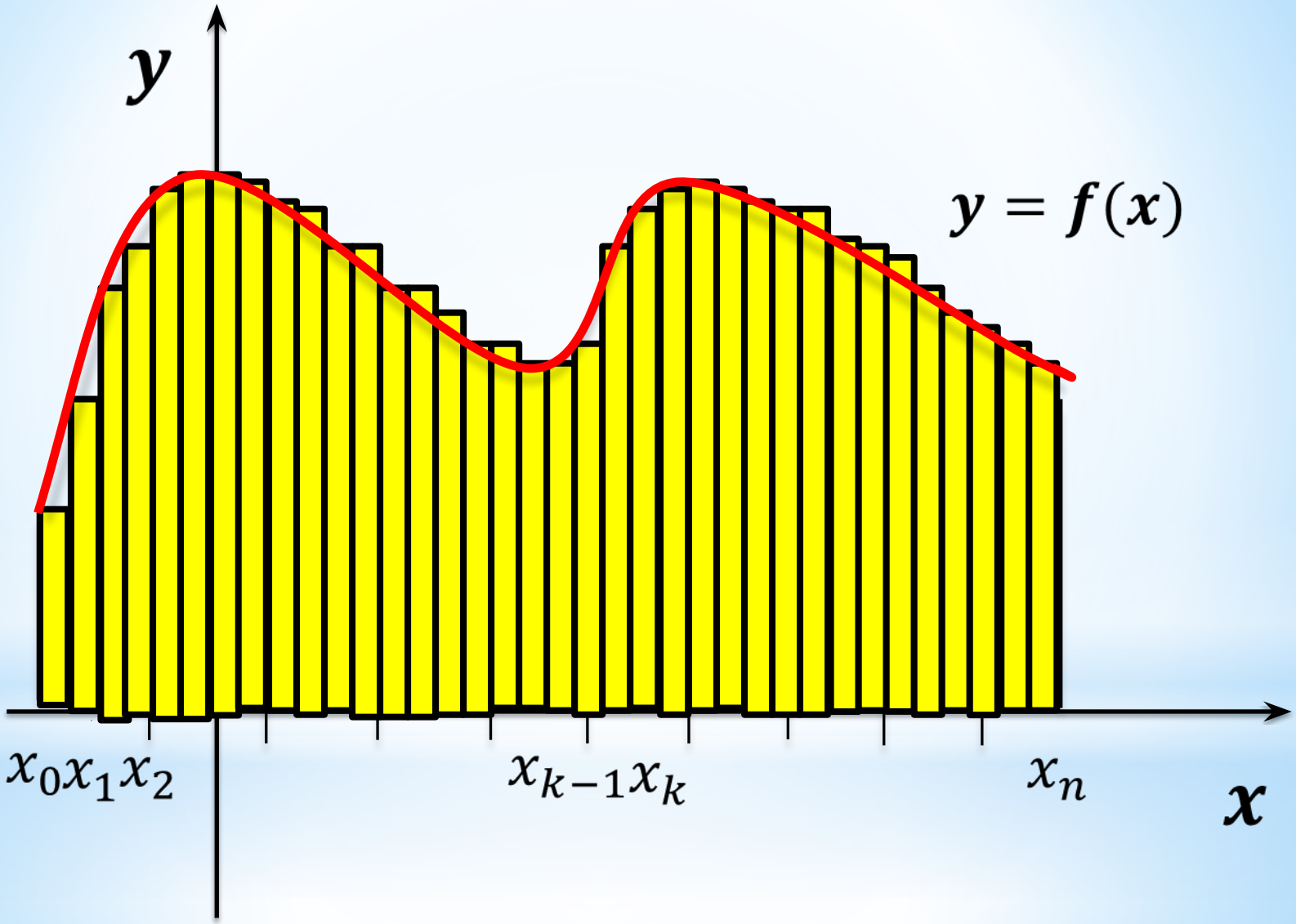



$$\Delta x = \frac{b-a}{n}$$


$y$
$y = f(x)$
$x_0$
$x_1$
$x_2$
$x_{k-1}$
$x_k$
$x_n$
$x$

$$S_n = f(x_0) \cdot \frac{b-a}{n} + f(x_1) \cdot \frac{b-a}{n} + \cdots + f(x_{n-1}) \cdot \frac{b-a}{n} =$$

$$= \frac{b-a}{n} \cdot \left(f(x_0) + f(x_1) + \cdots + f(x_{n-1})\right)$$


y
y = f(x)
x0x1x2
xk−1xk
xn
x

$$S = \int_a^b f(x)dx$$

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$\int$ -знак интеграла

$a$ - нижний предел

$b$ - верхний предел

$f$ - подынтегральная функция

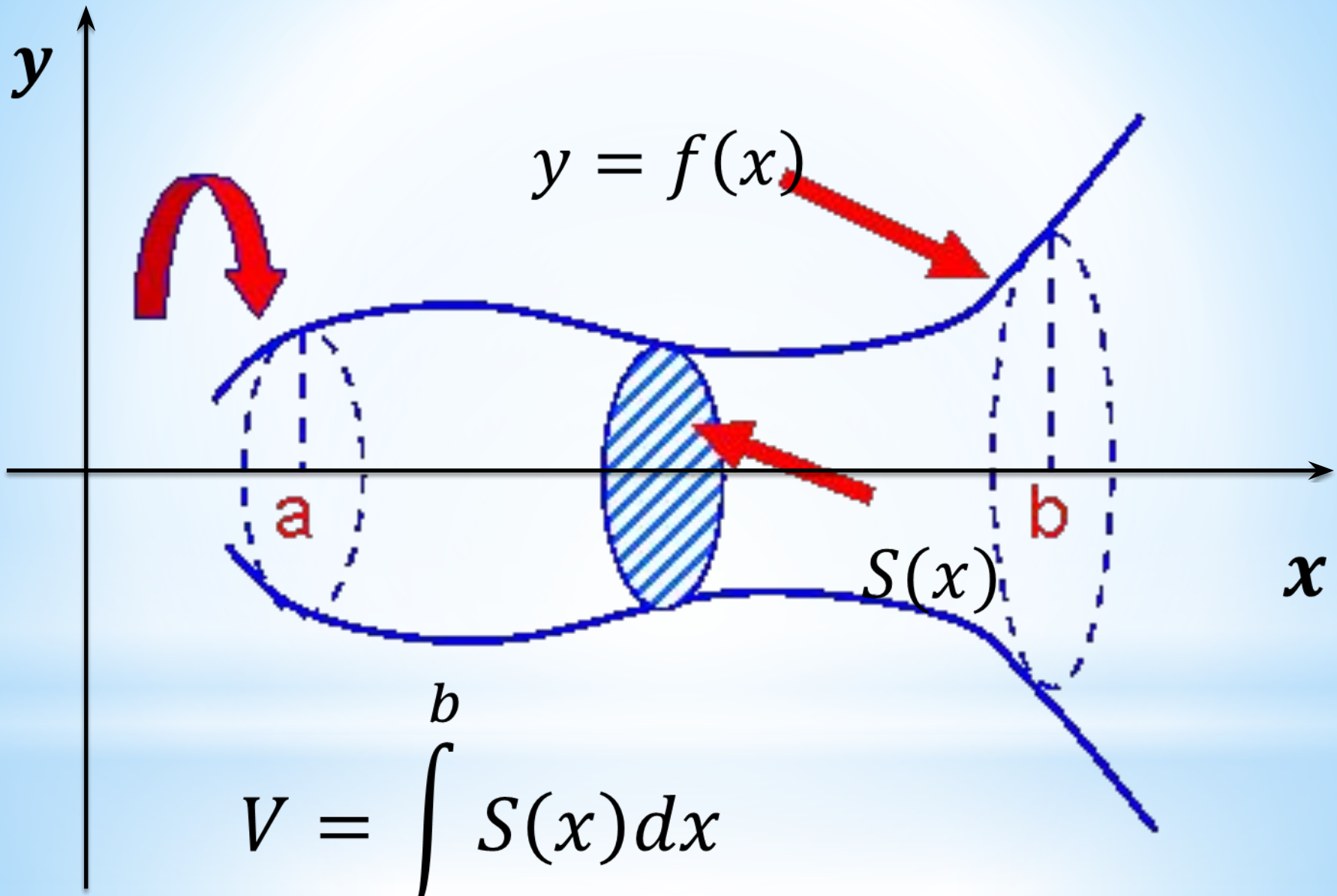
$x$ - переменная интегрирования

Если $a \geq b$, то

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

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

$$F(b) - F(a) = F(x)\Big|_a^b$$




$$V = \int_a^b S(x)dx$$