

Геометрическое приложение

определенного интеграла

Математический диктант

$$\int \sin x dx \quad \int \cos x dx$$

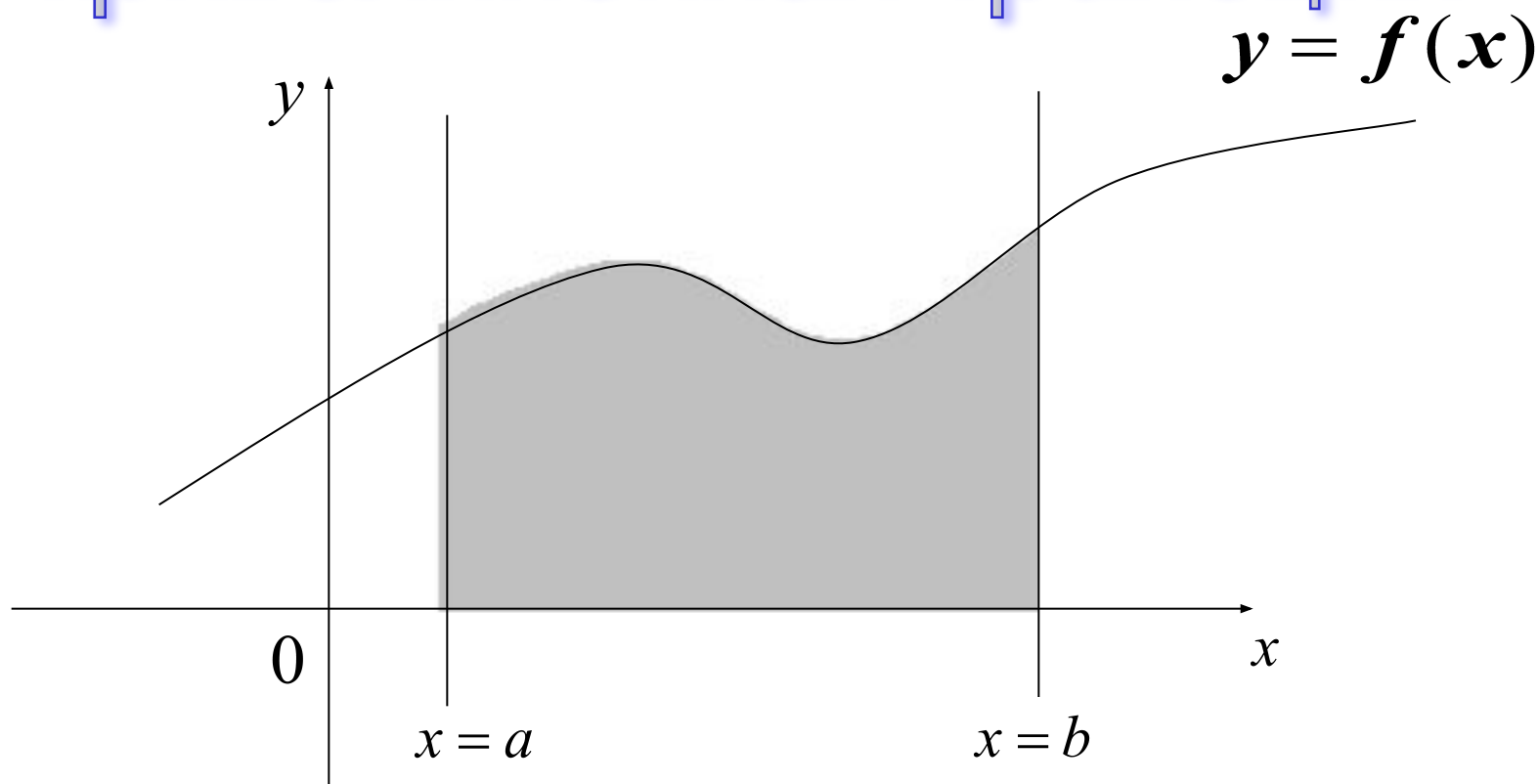
$$\int f(x) dx + \int f(x) dx$$

$$\int \frac{dx}{\cos^2 x} - \int \frac{dx}{\sin^2 x}$$

Вычисление площадей плоских фигур

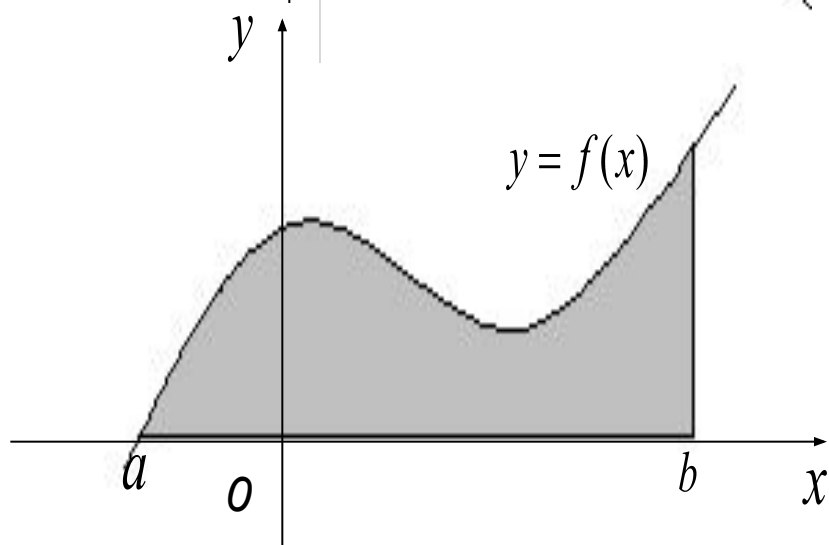
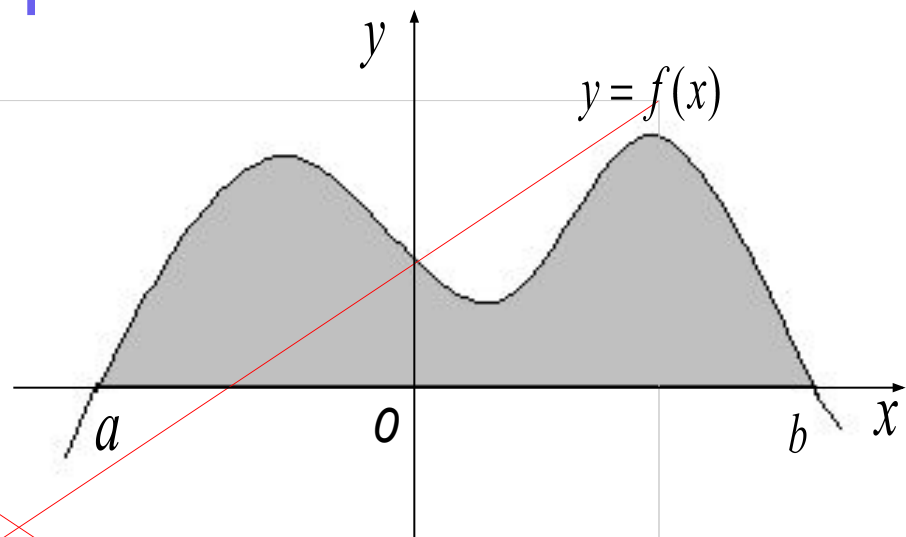
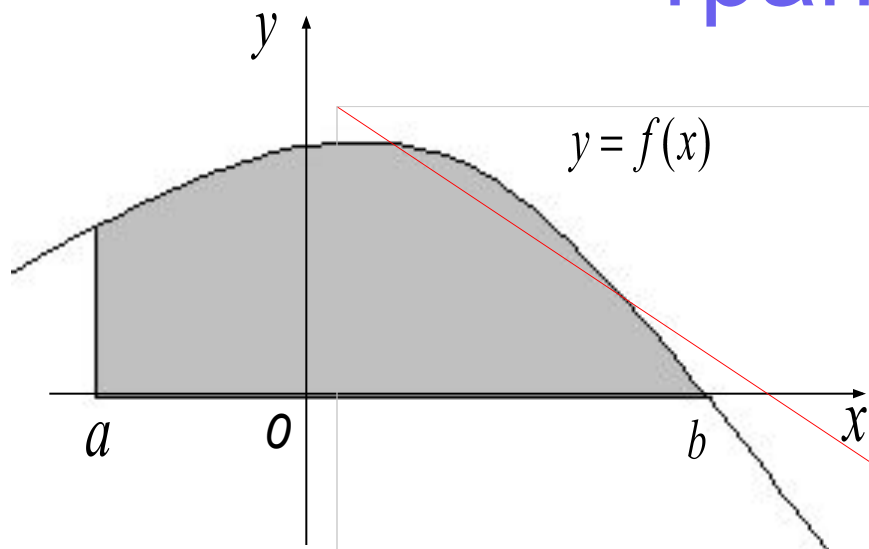
с помощью определенного интеграла

криволинейная трапеция



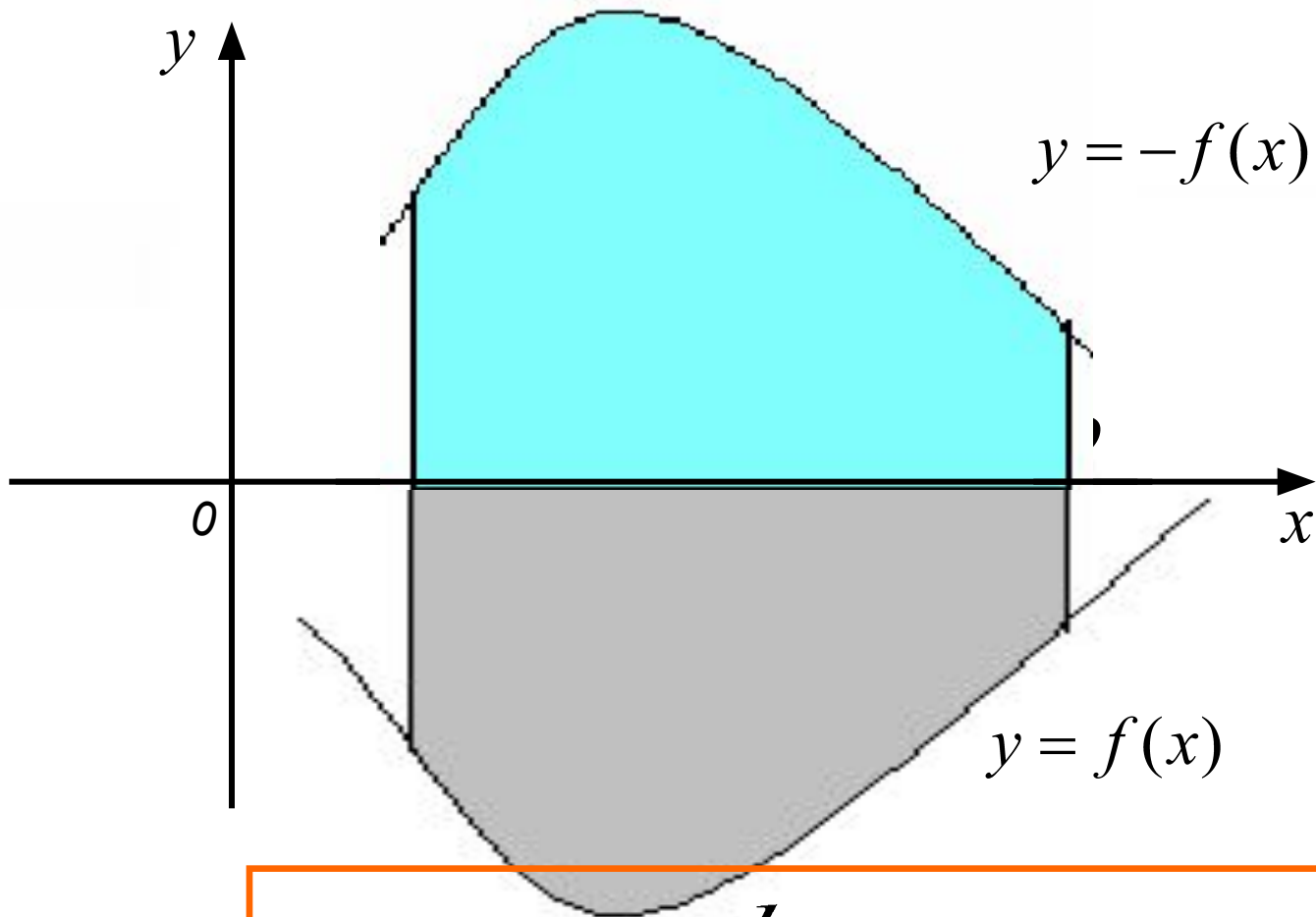
Ox ; $x = a$, $x = b$ ($a < b$);
 $y = f(x)$ ($f(x) \geq 0$) на $[a; b]$

Примеры криволинейных трапеций



$a - ?$ $b - ?$

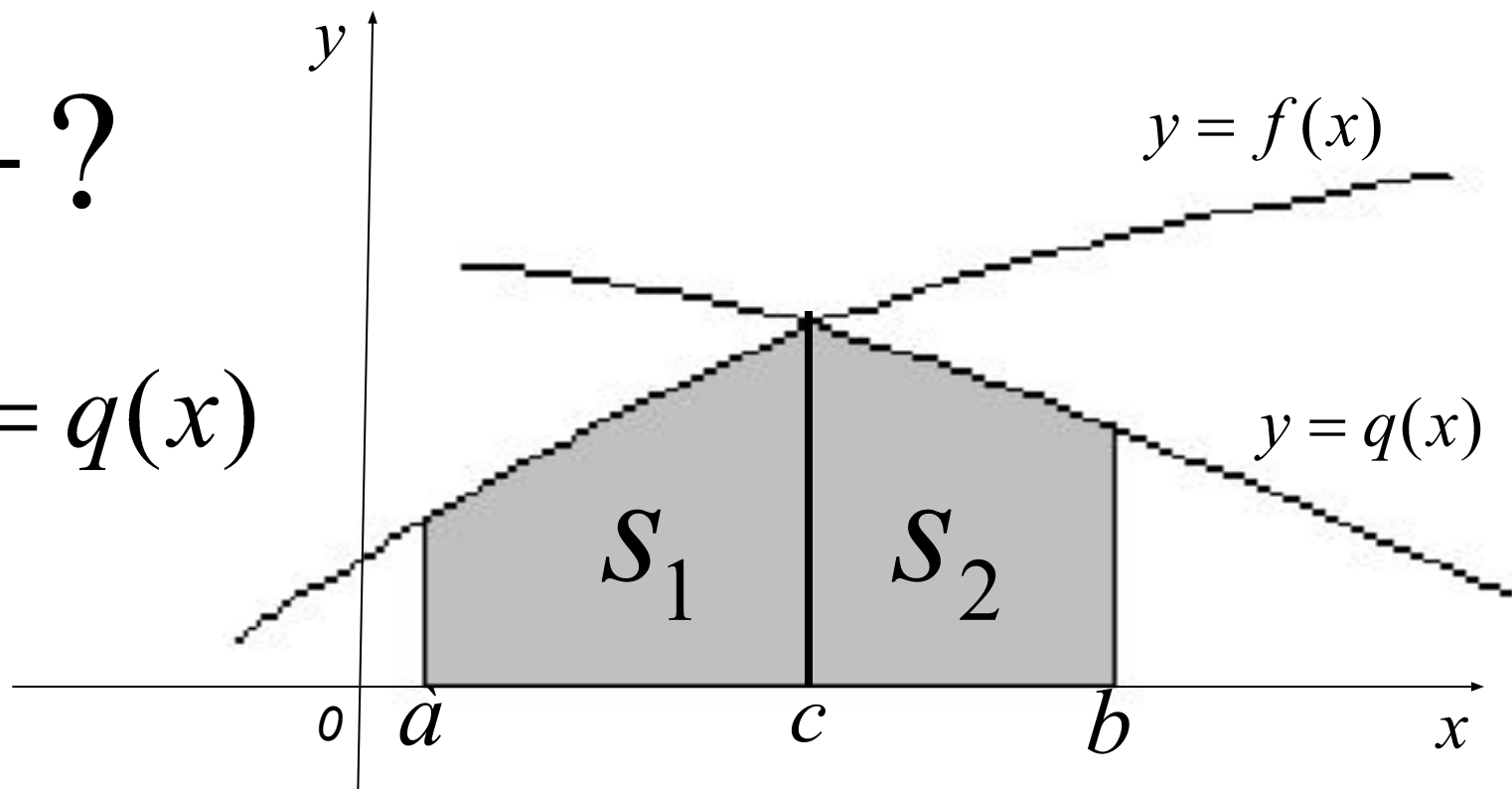
$$f(x) = 0$$



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

$c = ?$

$$f(x) = q(x)$$

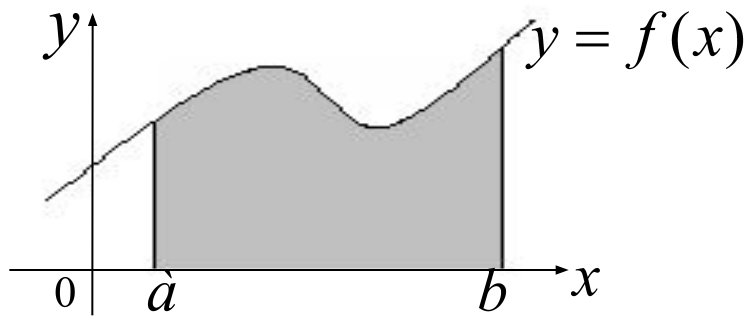


$$S = \int_a^c f(x) dx + \int_c^b q(x) dx$$

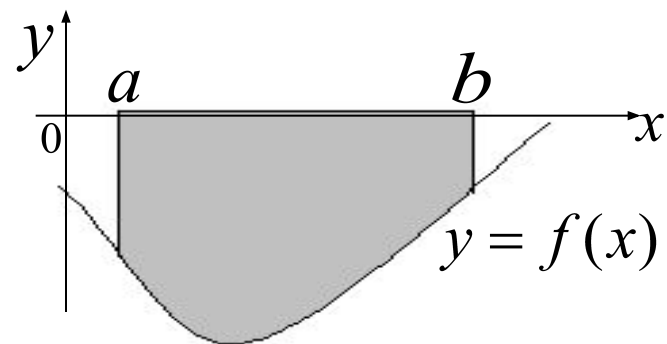


Алгоритм вычисления площади плоской фигуры:

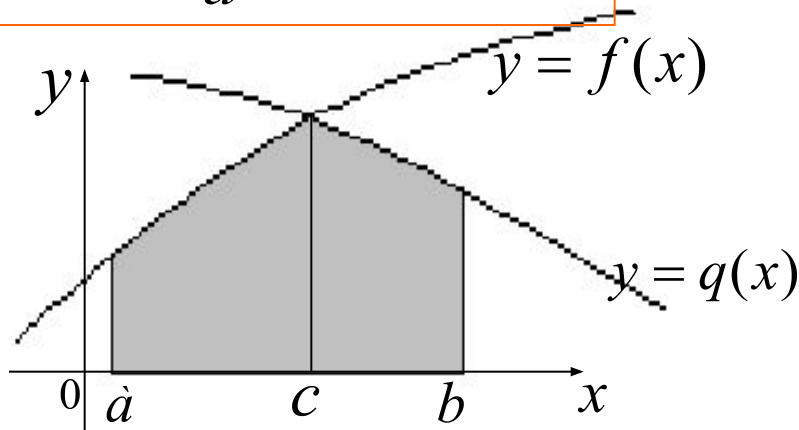
1. Построить чертеж (схематично);
2. Найти пределы интегрирования (при необходимости);
3. Составить формулу для вычисления площади фигуры с помощью определенного интеграла;
4. Вычислить площадь фигуры.



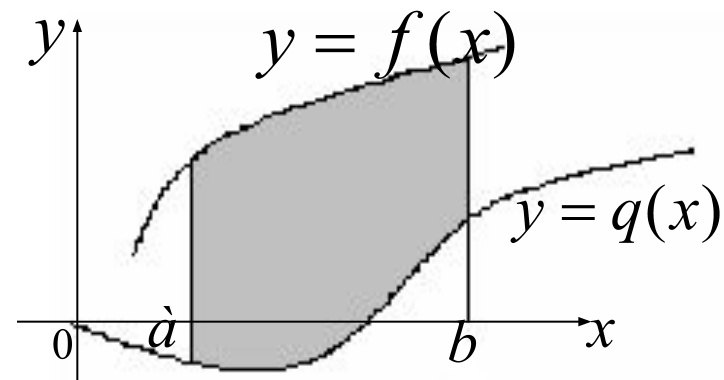
$$S = \int_a^b f(x) dx$$



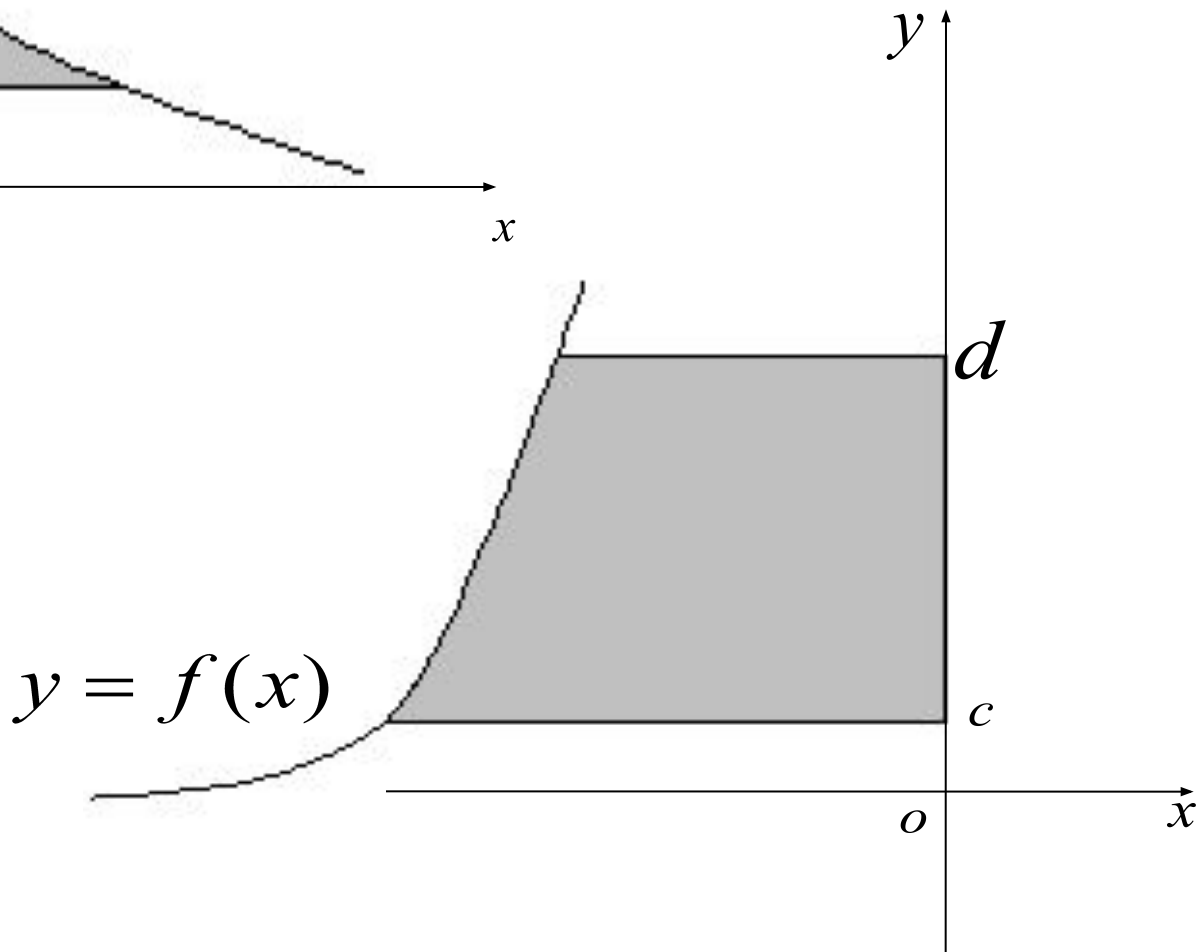
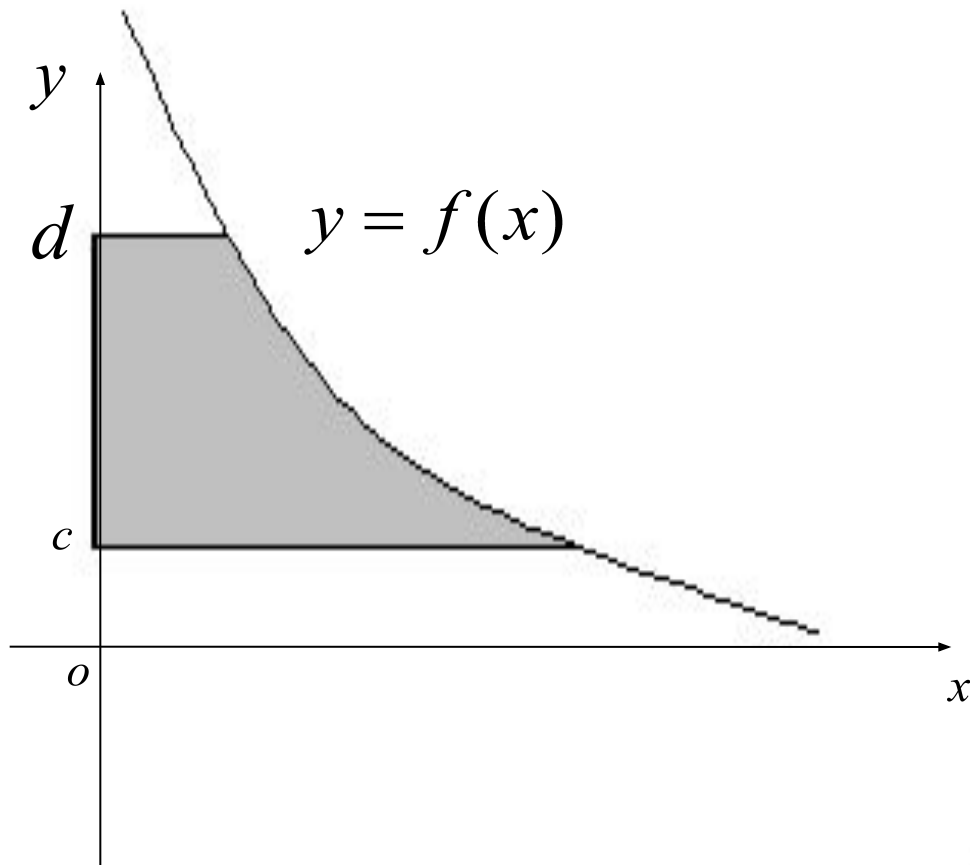
$$S = -\int_a^b f(x) dx$$

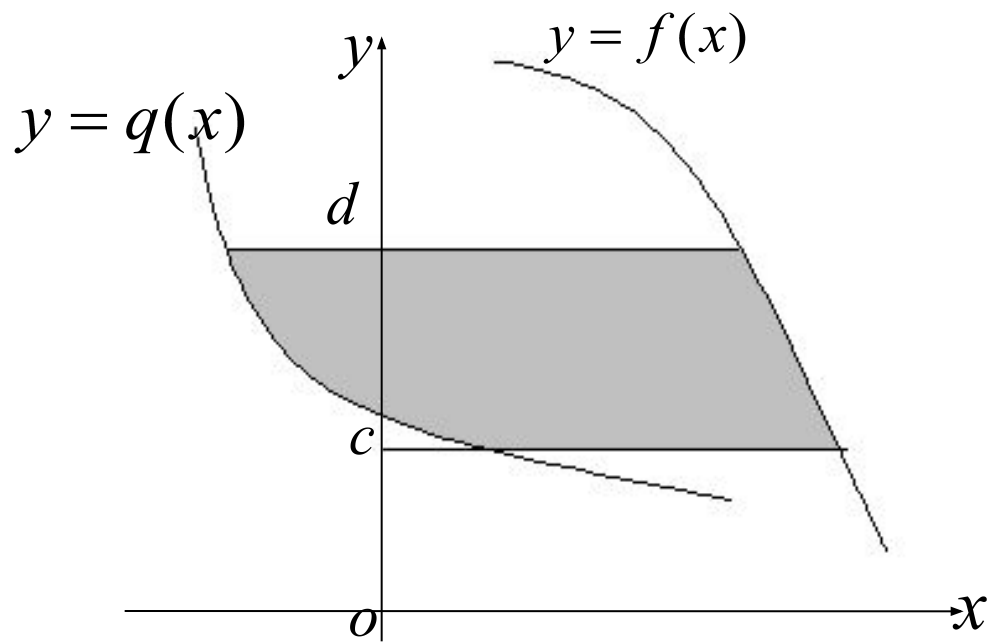
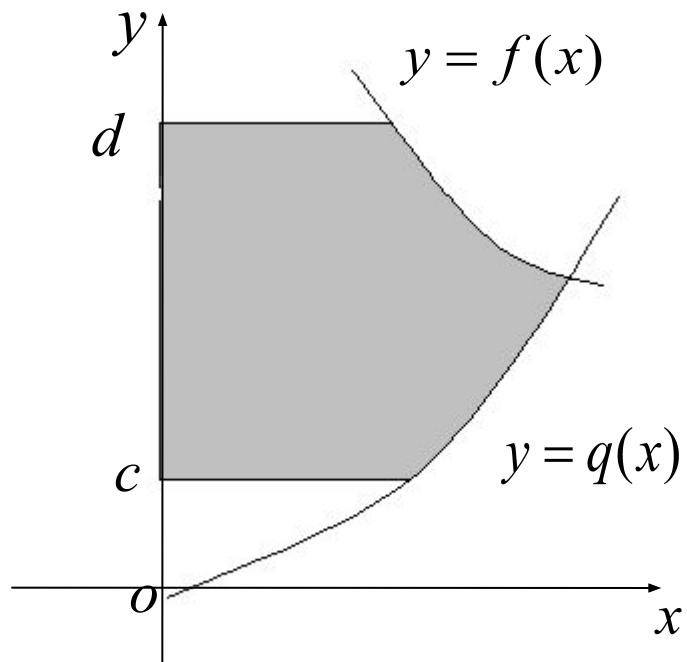


$$S = \int_a^{\tilde{n}} f(x) dx + \int_{\tilde{n}}^b q(x) dx$$



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





Тестовое задание по готовым чертежам

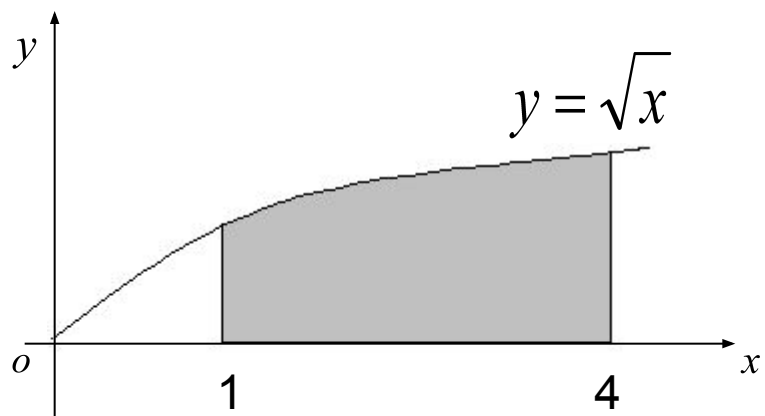


Рис. 1

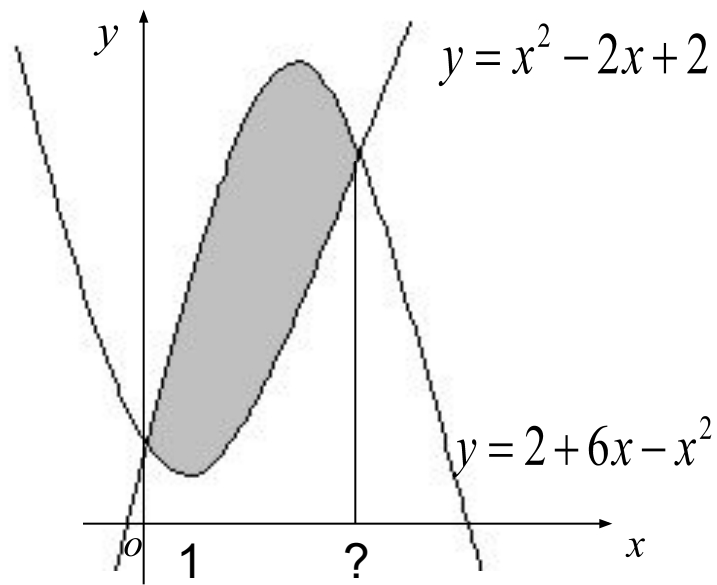


Рис. 2

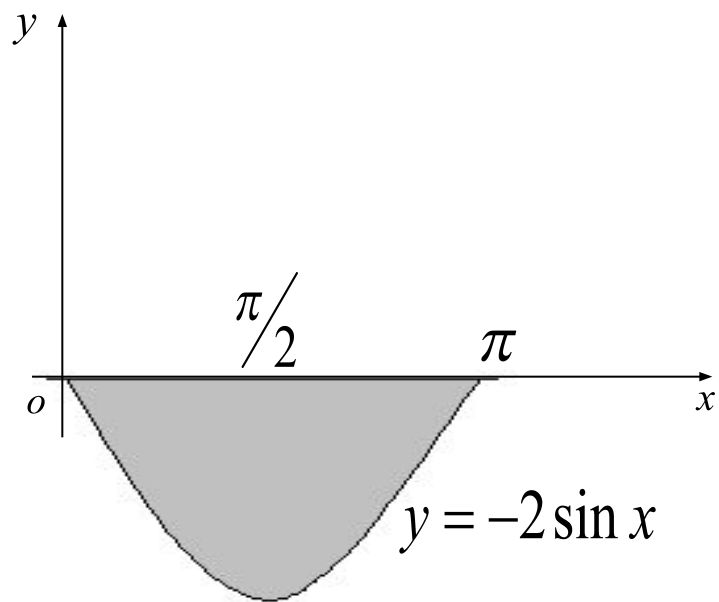


Рис. 3

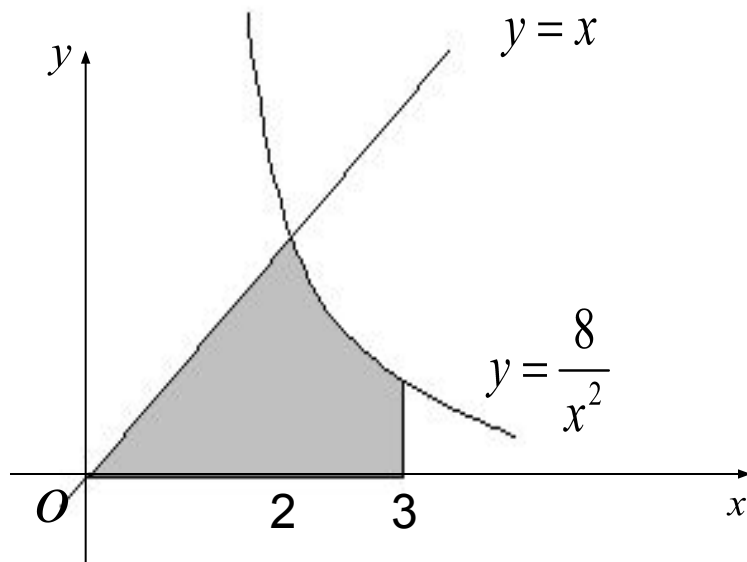
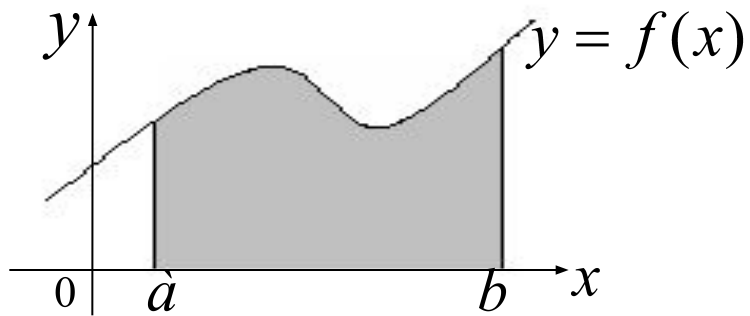
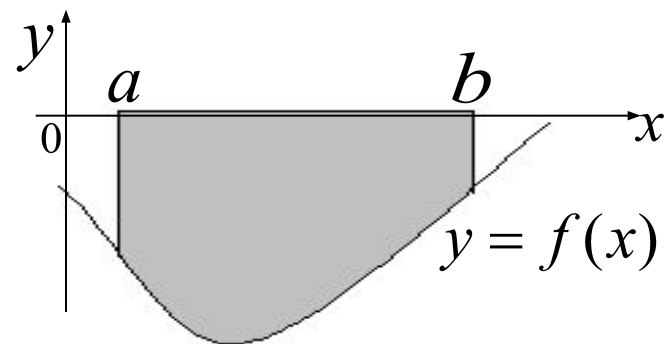


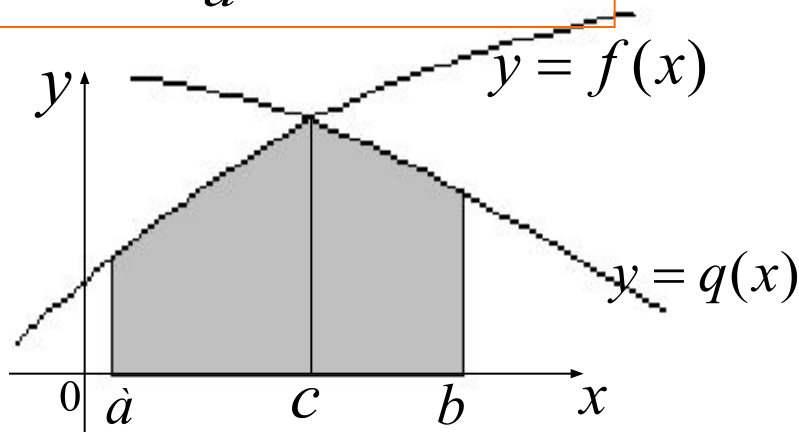
Рис. 4



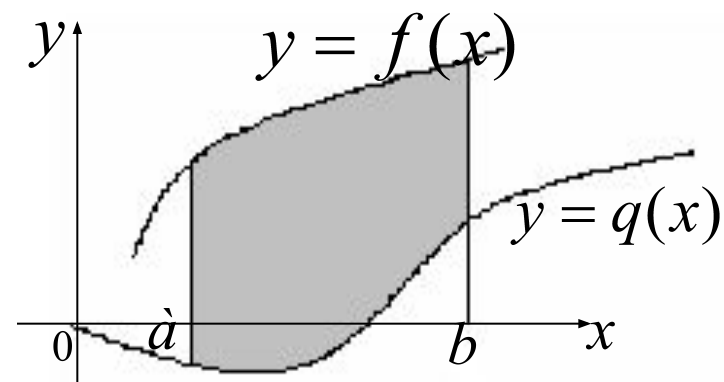
$$S = \int_a^b f(x) dx$$



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



$$S = \int_a^{\tilde{n}} f(x) dx + \int_{\tilde{n}}^b q(x) dx$$



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