$$\int_{a}^{b} f(x) \, dx = \lim_{n \to \infty} \sum_{i=1}^{n} f(x_{i}^{*}) \, \Delta x$$

Suppose we have two curves bounding a region.



Find the area of this region











Find the area of the region bounded by $f(x) = -6x^2 + 6x + 12$ and $g(x) = 12(x-1)^2$



Find the area of the region bounded by $f(x) = 2x - x^2$ and g(x) = 2 - x



Find the area of the region bounded by $f(x) = x^3 - 3x^2 + 3x$ and g(x) = x



Find the area of the region bounded by $f(x) = 1 + \sqrt{x}, g(x) = 1 - \sqrt{x}$ and the vertical line x = 1

$$f(x) = 1 + \sqrt{x}$$
$$g(x) = 1 - \sqrt{x}$$