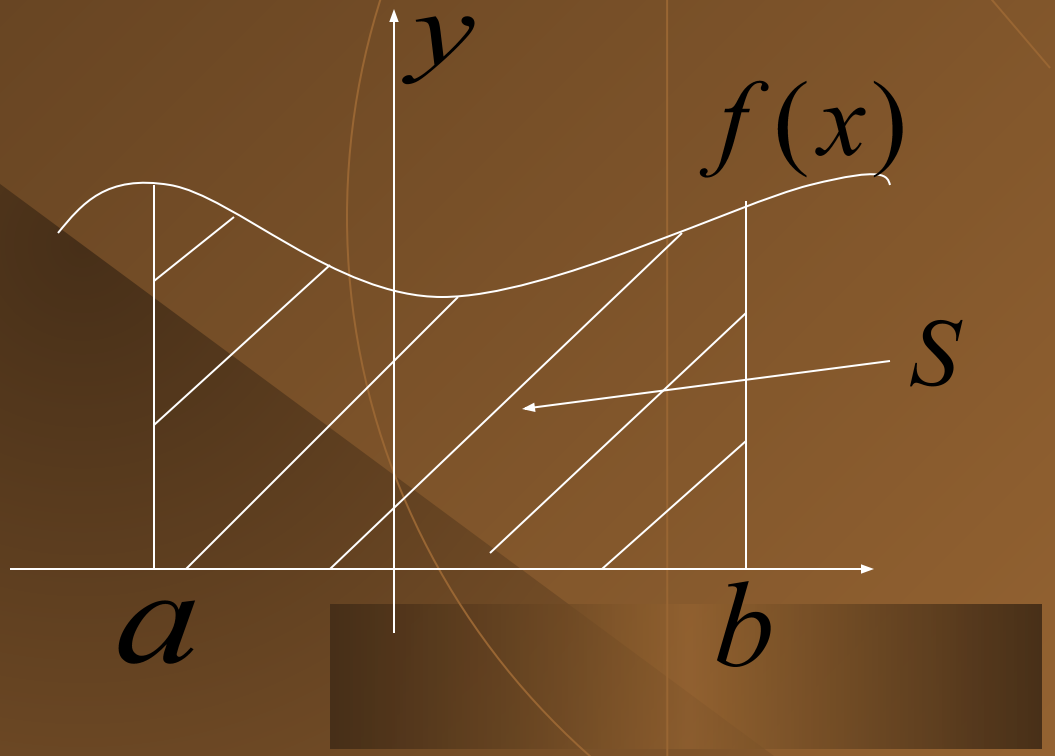
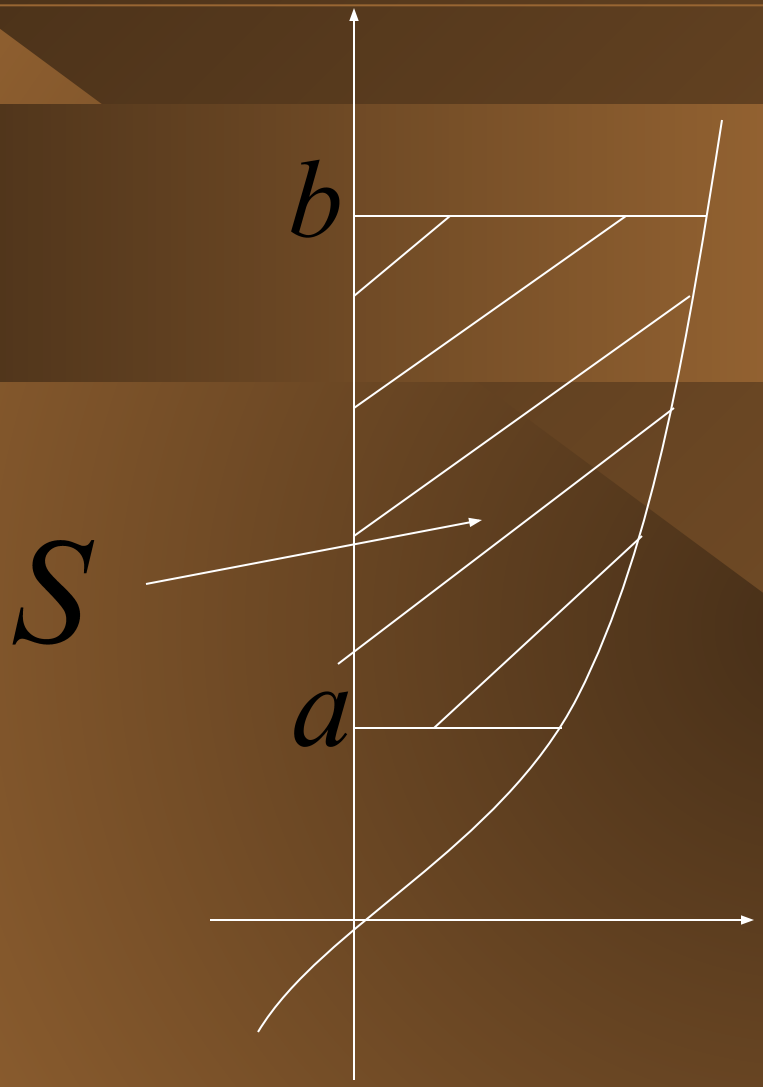
AREA AND VOLUME BY DEFINITE INTEGRAL

AREA

- We have a function y =f(x), and two points on the X axis a and b. Then the area formula is

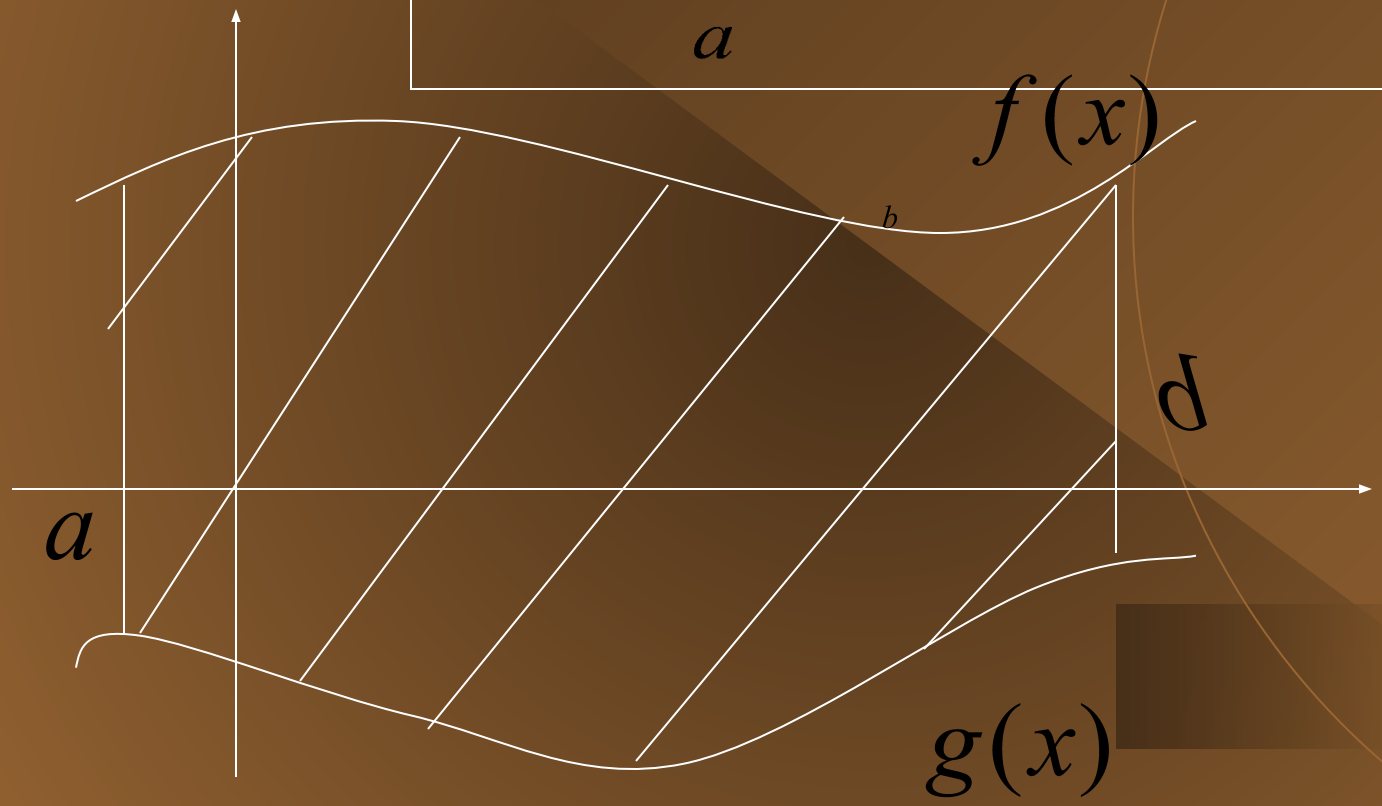
$$S = \int_a^b f(x)dx$$



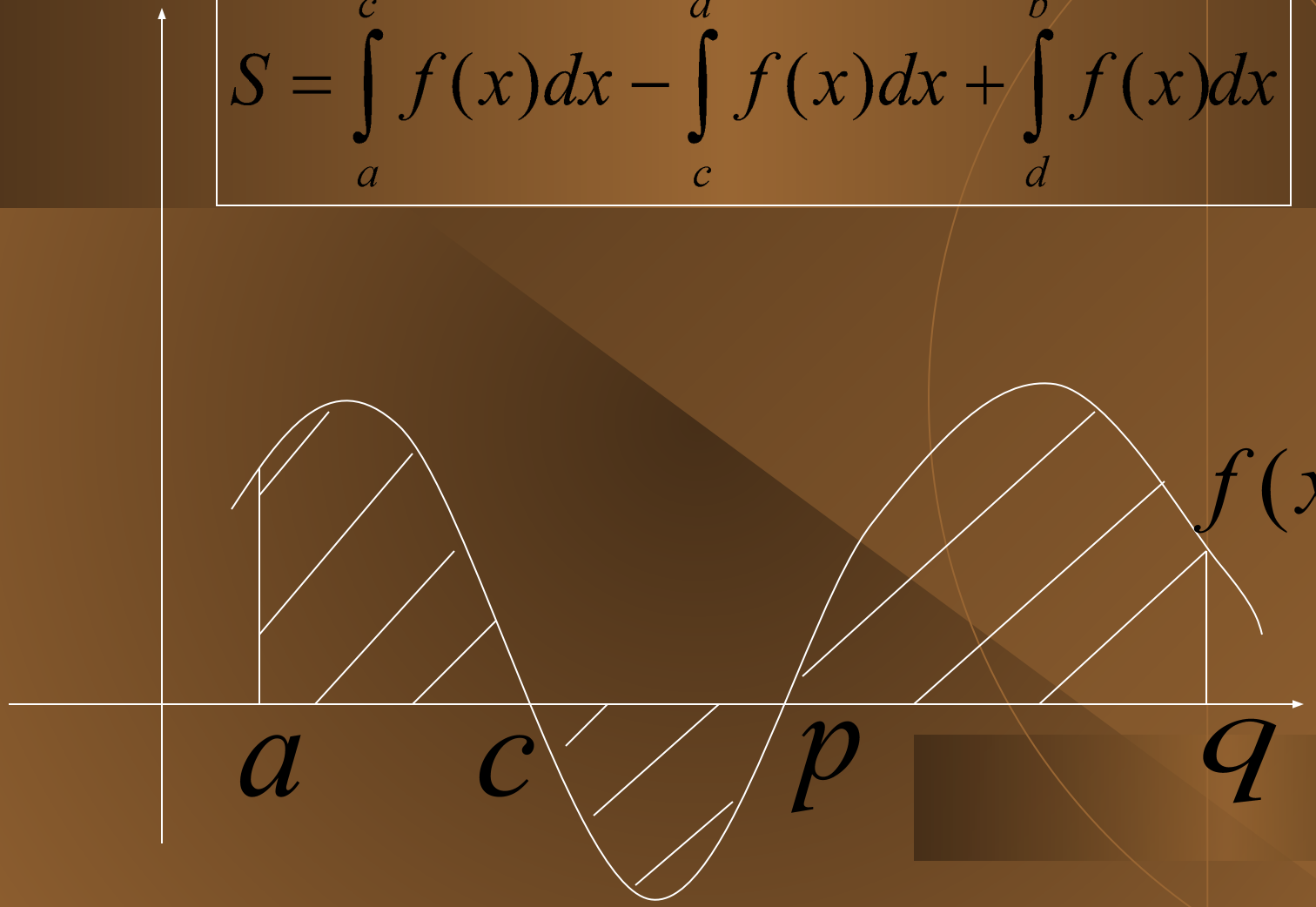


$$S = \int_a^b x\,dy$$

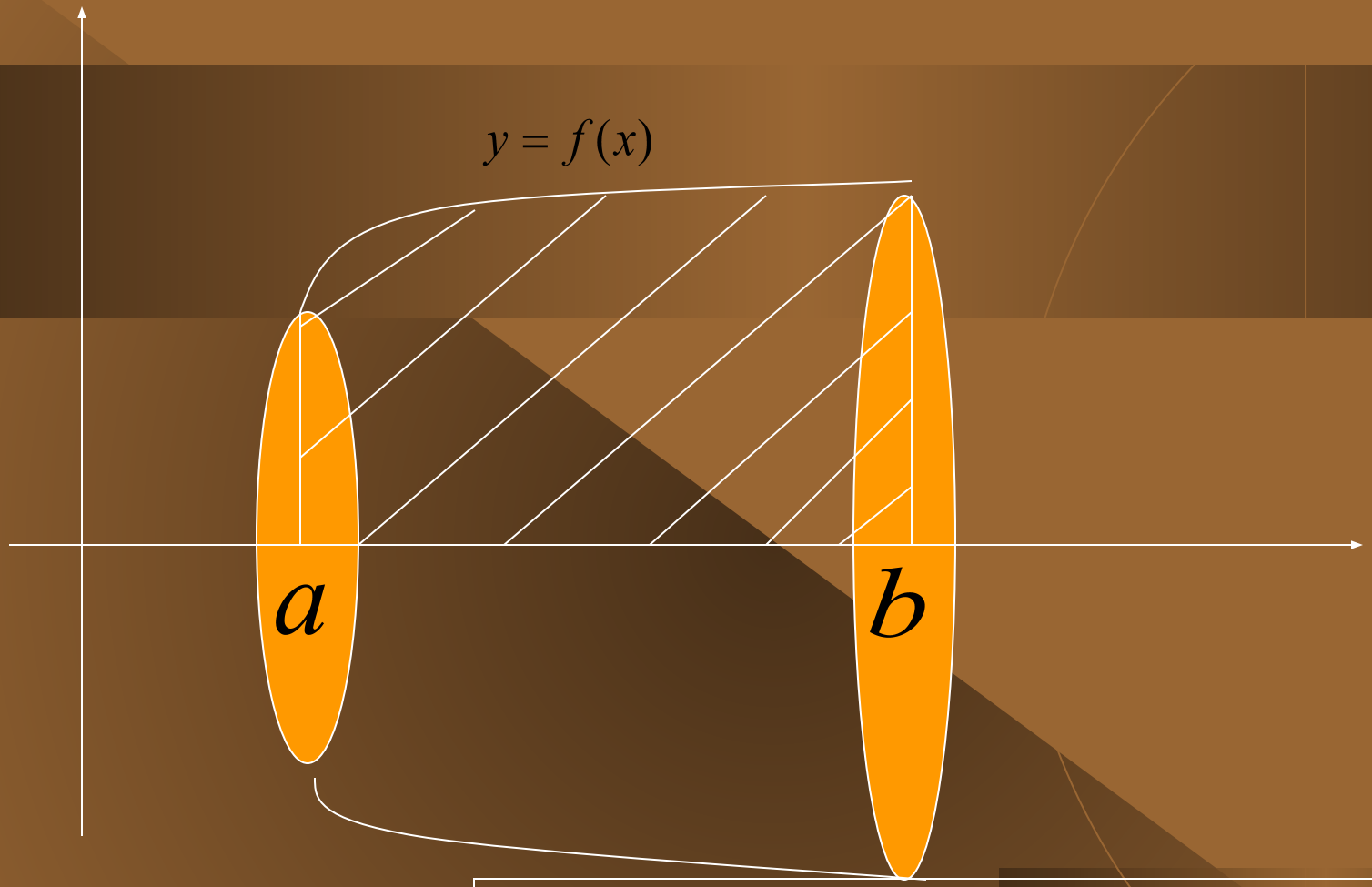
$$S = \int_a^b [f(x) - d(x)]dx$$



$$S = \int_a^c f(x)dx - \int_c^d f(x)dx + \int_d^b f(x)dx$$

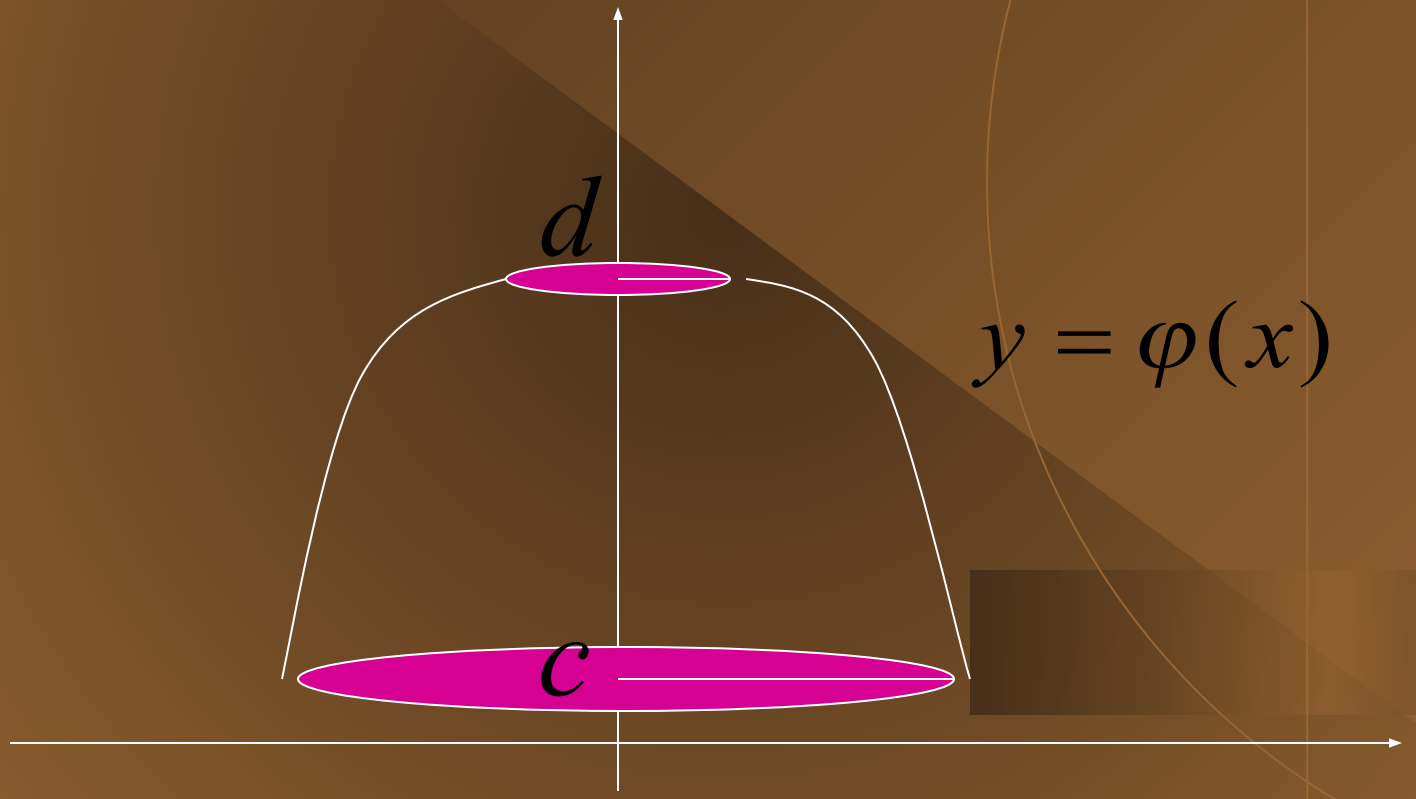


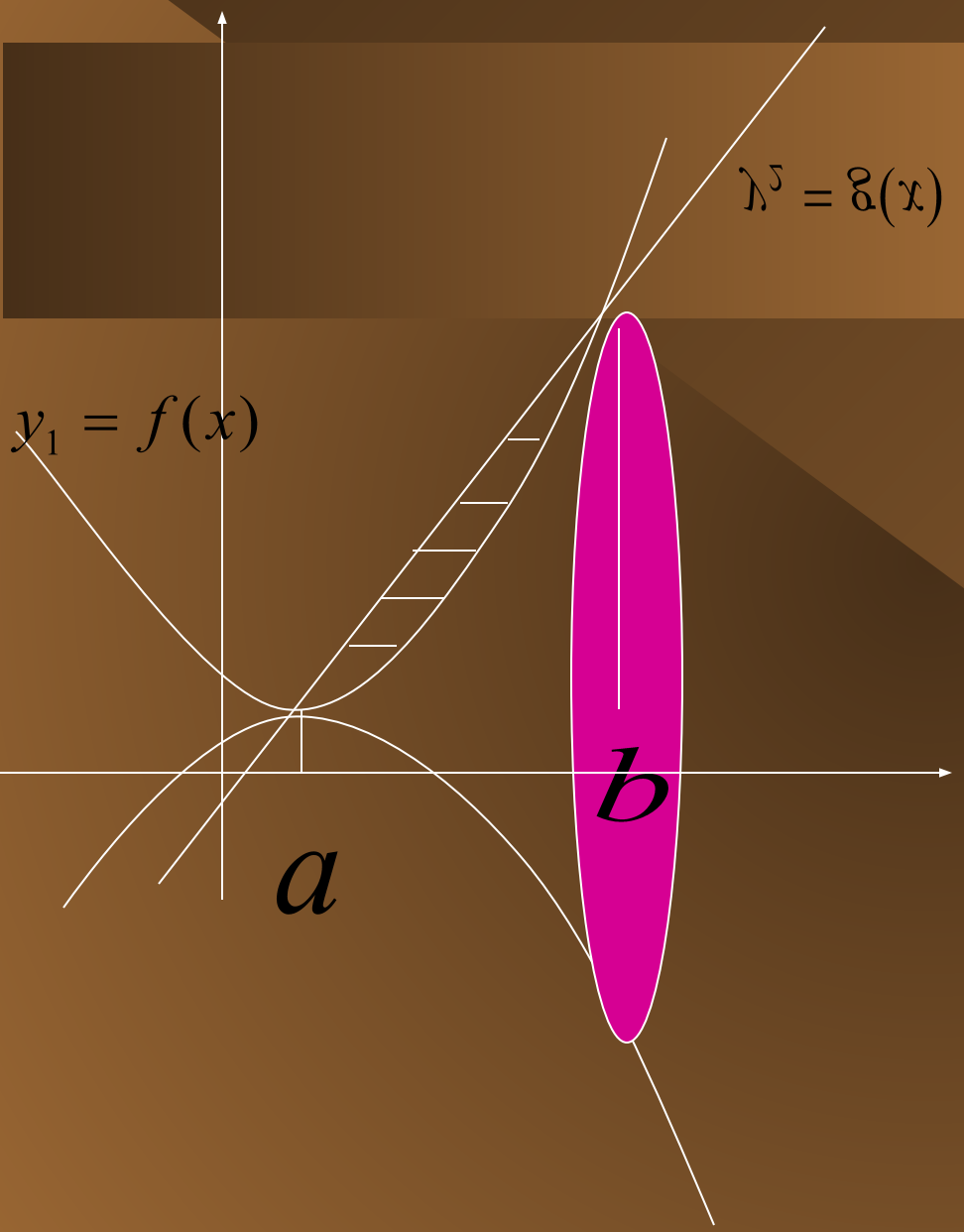
VOLUME



$$V_x = \pi \int_a^b y^2 dx = \pi \int_a^b f^2(x) dx$$

$$V_y = \pi \int_c^d x^2 dy = \pi \int_c^d \varphi^2(y) dy$$





$$V_x = \pi \int_a^b (y_1^2 - y_2^2)dx$$

$$V_y = \pi \int_a^b (x_1^2 - x_2^2)dx$$