Aniq integraldan Geometik fizik Masalalarni echishda foydalanich.

$$\int x\,dx = \frac{x^2}{2} + C$$

$$\int 5^x\,dx = 5^x \ln 5 + C$$

$$\int \frac{dx}{x} = \ln\left|x\right|$$
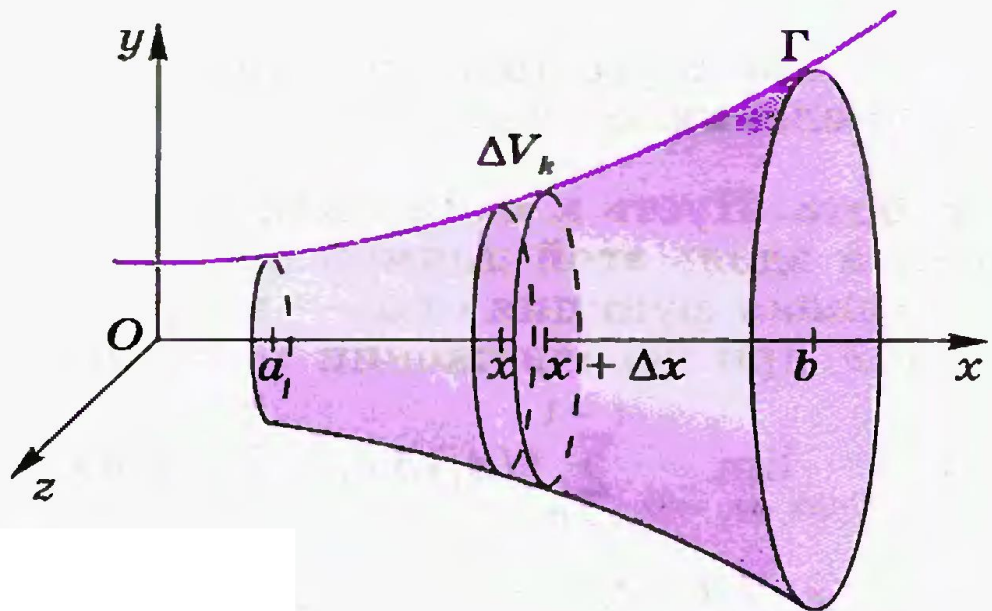
$$\int x^2\,dx = \frac{x^3}{3} + C$$

$$\int \cos x \, dx = \sin x + C$$

$$\int \cos 2x \, dx = \frac{1}{2} \sin 2x + C$$

$$\int_a^b f(x)\,dx$$

$$= \lim_{\max \Delta x_j \to 0} \sum_{k=0}^{n-1} f(x)\Delta x_j$$
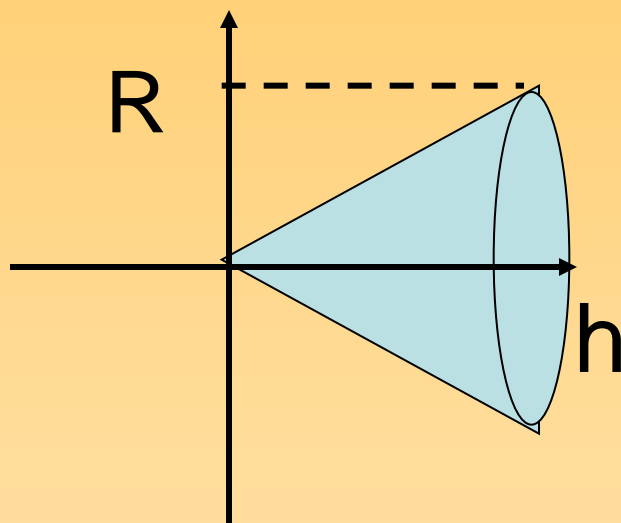
Avlanma iismning hajmi

a=x0<x1<…<xn=b

$$\Delta V_k \approx \pi y_k^2 \Delta x_k =$$

$$= \pi \left(f(x_k) \right)^2 \Delta x_k$$

$$V \approx \pi \sum_{k=0}^{n-1} \left(f(x_k) \right)^2 \Delta x_k$$

$$V = \lim_{\max \Delta x_k \to 0} \pi \sum_{k=0}^{n-1} \left(f(x_k) \right)^2 \Delta x_k$$

$$V = \pi \int_a^b \left(f(x) \right)^2 dx$$

№ 1. Aylanma jismning hajmini topish fo'mulasidan foydalanib ko'nusning hajmini toping.

$$y = \frac{R}{h}x$$

R

h

$$V = \pi \int_0^h \left(\frac{R}{h}x \right)^2 dx = \pi \cdot \frac{R^2}{h^2} \cdot \frac{x^3}{3} \Big|_0^h = \frac{1}{3}\pi R^2 h$$

№ 2

Ushbu y= sinx, 0≤x≤π funksiy
Grafigining OX o'qi atrofida aylanishidan
hosil bo'lgan jismning hajmini toping

$$V = \pi \int\limits_0^\pi \sin^2 x\, dx = \frac{\pi^2}{2}$$

№ 3 Quyidagi chiziqlar bilan ularning OY o'qi atrofi atrofida aylanichidfnHosil bo'lgan jismning hfjmini toping

Chiziqlar:

$$y = \frac{x^2}{2}$$, x=0, y = $2\sqrt{2}$

Рис. 191.

вокруг оси Oy

$$V = \pi \int_a^b x^2\, dx$$

$$V = \pi \int_0^{2\sqrt{2}} \left(\sqrt{2y}\right)^2 dy = \pi \int_0^{2\sqrt{2}} 2y\, dy = \pi\, y^2 \Big|_0^{2\sqrt{2}} = 8\pi$$