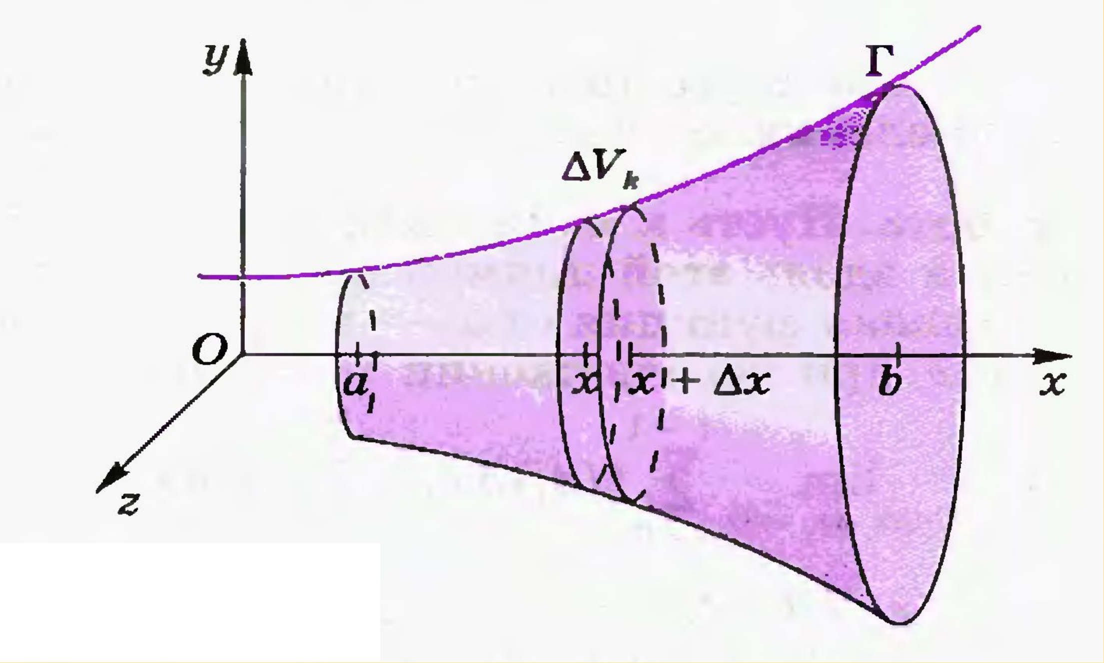
Aylanma jismning hajmi



a=x0<x1<…<xn=b

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

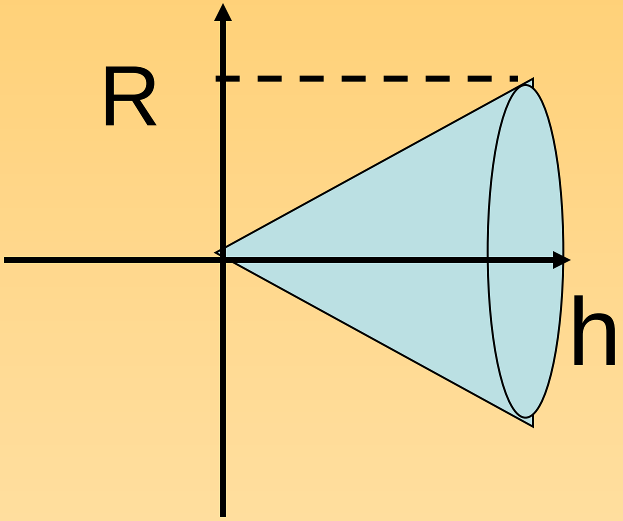
$$= \pi \left(f\left(x_k \right) \right)^2 \Delta x_k$$

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

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

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

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



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

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

№ 2

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

$$V = \pi \int_0^{\pi} \sin^2 x dx = \frac{\pi^2}{2}$$

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

Chiziqlar:

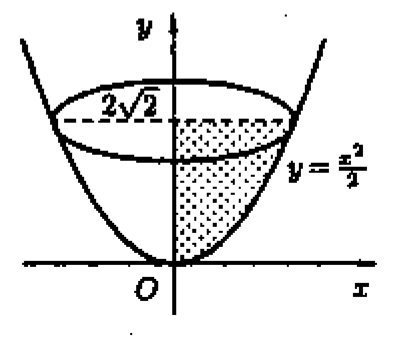


Рис. 191.

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

вокруг оси Оу

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

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

ANIQ INTEGRAKNING TADBIG’I

Aniq integralni fizikada qollash

ISH HISOBLASH

$$W = \lim_{\max \Delta x_j \to 0} \sum_{j=0}^{n-1} f\left(x_j\right)\Delta x_j = \int_a^b f(x)dx$$

где $a=x_0<x_1<\ldots<x_n=b$, $\Delta x_j = x_{j+1} - x_j$

№ 4. Bir nuqtaga qo'yilgan kuchning berilgan f=2x-1 to'g'ri chiziq bo'ylab Harakatkanuvchi kuchning bajargan Ichini hisoblang. Kuch F 0 nuqtadan 3 nuqtagacha siljiydi.

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

$$A = \int_0^3 (2x-1)dx = (x^2 - x)\Big|_0^3 = 6$$

Zichligi o'garuchan sterjinning massasini

$$M = \lim_{\max \Delta x_j \to 0} \sum_{j=0}^{n-1} \rho(x_j)\Delta x_j = \int_a^b \rho(x)dx$$

bunda

a=x0<x1<…<xn=b, Δxj=xj+1-xj

№ 5. Berilgan zichlikga ega sterjinning 0; 2 kesmadagi massasini hisoblab toping

$$\rho(x) = x + 1$$

$$M = \int_0^2 (x+1)dx = \left(\frac{x^2}{2} + x \right)\Bigg|_0^2 = 4$$