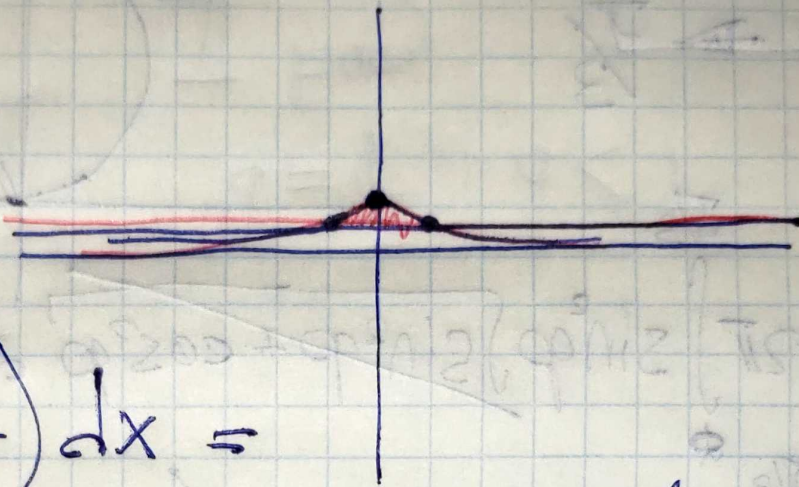


УЧДУ РК БИЛЕТ №10 (23)

№1

$$y = \frac{1}{1+x^2}$$

$$y = \frac{1}{2}$$



$$S = \int_{-1}^1 \left(\frac{1}{1+x^2} - \frac{1}{2} \right) dx =$$

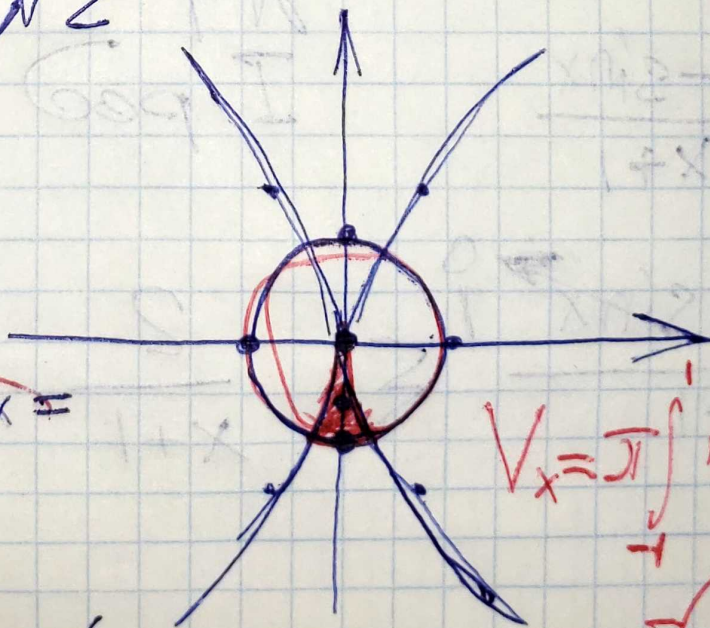
$$= \int_{-1}^1 \left(\frac{2 - x^2}{2(1+x^2)} \right) dx = \frac{1}{2} \int_{-1}^1 \frac{2 - x^2}{1+x^2} dx = \frac{1}{2} \left(\int_{-1}^1 \frac{2}{1+x^2} dx - \int_{-1}^1 \frac{x^2}{1+x^2} dx \right) =$$

$$= \left(\arctg x - \frac{x}{2} \right) \Big|_{-1}^1 = \frac{\pi}{4} - \frac{1}{2} + \frac{\pi}{4} - \frac{1}{2} = \frac{\pi}{2} - 1$$

№2

$$y = \pm \sqrt{3x^2}$$

$$y = \pm \sqrt{4-x^2}$$



$$V_x = \pi \int_{-1}^1 (3x^2 - 4 + x^2) dx =$$

$$= 4\pi \int_{-1}^1 (x^2 - 1) dx =$$

$$= 4\pi \left(\frac{x^3}{3} - x \right) \Big|_{-1}^1 = 4\pi \left(-\frac{2}{3} - \frac{2}{3} \right) = -\frac{16\pi}{3}$$

$$V_x = \pi \int_{-1}^1 (4 - x^2 - 3x^2) dx =$$

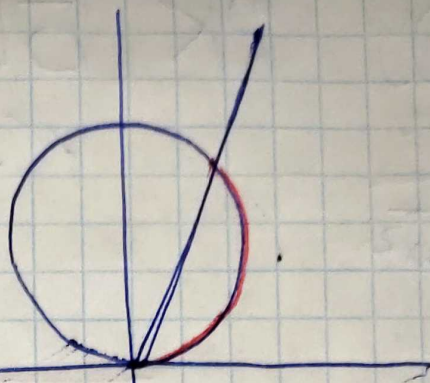
$$= \frac{16\pi}{3}$$

?

$$\rho = \sin \varphi$$

$$\varphi \rightarrow \pi/3$$

$\pi/3$



$$S = \int_0^{\pi/3} 2\pi \int \sin^2 \varphi \sqrt{\sin^2 \varphi + \cos^2 \varphi} d\varphi =$$

$$= 2\pi \int_0^{\pi/3} \frac{1 - \cos 2\varphi}{2} d\varphi = 2\pi \left(\frac{\varphi}{2} - \frac{\sin 2\varphi}{4} \right) \Big|_0^{\pi/3} =$$

$$= 2\pi \left(\frac{\pi}{6} - \frac{\sqrt{3}}{8} - 0 - 0 \right) = \frac{\pi^2}{3} - \frac{2\pi\sqrt{3}}{4} > 0$$

?

$$\int_1^{\infty} \frac{2 - \sin x}{x+1}$$

π^4
I poe

$$\frac{2 - \sin x}{x+1} \rightarrow 0$$

$$\frac{2}{x+1} < \frac{2}{x} \quad \varphi = 1 \quad \varphi \geq 1 \quad \text{eoeoe}$$

N³

$$\int_0^1 \frac{x\sqrt{x}}{t g^2 x} dx$$

Γ pcc

Excc

$$q = \frac{1}{2} \quad q < 1$$

$$\frac{x\sqrt{x}}{t g^2 x} \approx \frac{1}{x^{3/2}}$$