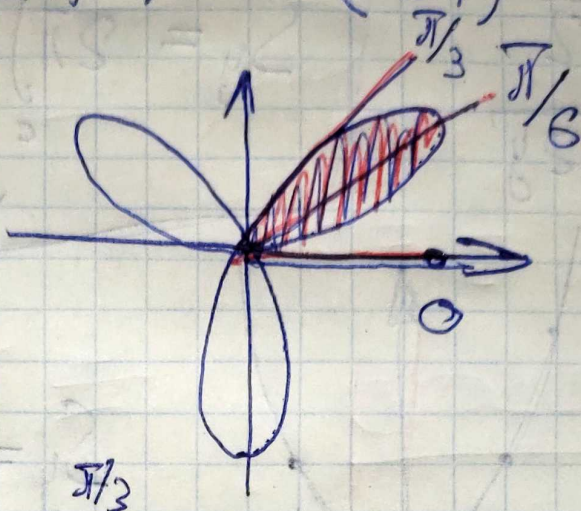


УЧДУ РК1 Тунем N8 (21)
N1

$$\rho = \sin 3\varphi$$



$$S = \frac{1}{2} \int_{\pi/3}^{\pi/6} \rho^2 d\varphi$$

$$S = \frac{1}{2} \int_{\pi/3}^{\pi/6} \sin^2 3\varphi d\varphi = \frac{1}{2} \int_0^{\pi/3} \frac{1 - \cos 6\varphi}{2} d\varphi = \left(\frac{\varphi}{4} + \frac{\sin 6\varphi}{24} \right) \Big|_0^{\pi/3}$$

$$= \frac{\pi}{12} + 0 - 0 - 0 = \frac{\pi}{12}$$

$$x^2 = y^2 + 1$$

$$y^2 = x^2 - 1$$

$$x^2 = 2$$

$$y = \pm \sqrt{x^2 - 1}$$

$$\frac{V}{2} = 2\pi \int_1^{\sqrt{2}} x \cdot \sqrt{x^2 - 1} dx = \left| t = x^2 - 1 \right|_{dx = \frac{dt}{2x}} = \pi \int_1^1 t^{\frac{1}{2}} dt =$$

$$= \frac{2\pi t^{\frac{3}{2}}}{3} = \frac{2\pi (x^2 - 1) \sqrt{x^2 - 1}}{3} \Big|_1^{\sqrt{2}} = \frac{2\pi}{3} - 0$$

$$V = \frac{4\pi}{3} \text{ м.к}$$

м.к. или можно только при $y \geq 0$.

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

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

$$x' = \sqrt{2y}$$

$$S_y = 2\pi \int_c^d f(x) \cdot \sqrt{1 + (f'(y))^2} dy$$

$x = f(y)$

$$S_y = 2\pi \int_0^{1/2} \sqrt{2y} \cdot \sqrt{1 + \frac{1}{2y}} dy$$

$$= 2\pi \int_0^{1/2} \frac{\sqrt{2y} \cdot \sqrt{2y+1}}{\sqrt{2y}} dy$$

$$= 2\pi \int_0^{1/2} \sqrt{2y+1} dy = \left| \frac{t=2y+1}{dy = \frac{dt}{2}} \right| =$$

$$= \pi \int_1^2 \sqrt{t} dt = \frac{2\pi (2y+1) \sqrt{2y+1}}{3} \Big|_0^{1/2} =$$

$$= \frac{2\pi \cdot 2 \cdot \sqrt{2}}{3} - \frac{2\pi \cdot 1 \cdot 1}{3} = \frac{4\pi\sqrt{2} - 2\pi}{3}$$

$$\int_1^{+\infty} \frac{4 + \cos x}{\sqrt{x^3+1}} dx$$

N4

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$$\frac{4 + \cos x}{\sqrt{x^3+1}} \leq \frac{5}{\sqrt{x^3+1}}$$

$$< \frac{5}{x^{3/2}}$$

$$< \frac{5}{x^{3/2}}$$

$$q = \frac{3}{2} \quad q > 1$$

conver

$$\int_0^1 \frac{\sin \sqrt{x}}{x} dx$$

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$$\frac{\sin \sqrt{x}}{x} \sim \sqrt{x}$$

$$\frac{\sqrt{x}}{x} \sim \frac{1}{\sqrt{x}}$$

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

converges