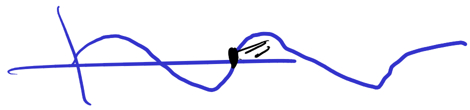
f spoj $[a,b)$

$$\int_a^b f \ \mathrm{D} \iff \exists \varepsilon > 0 \ \ \forall b' \in (a,b) \ \ \exists x_1, x_2$$

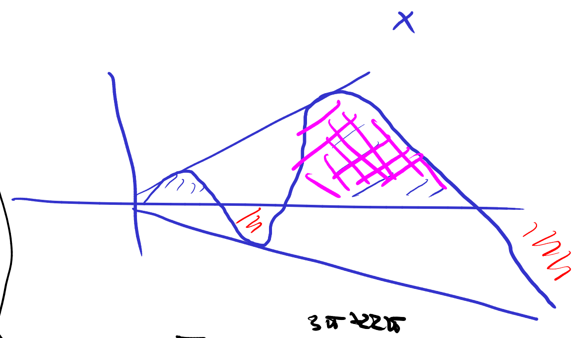
$$b' < x_1 < x_2 < b$$

$$\left| \int_{x_1}^{x_2} f \right| \geq \varepsilon .$$

Pf. $\displaystyle\int_1^\infty x^\alpha \sin x \, dx \qquad \alpha \geq 0$



$$\left| \int_{2\pi + 2k\pi}^{3\pi + 2k\pi} x^\alpha \sin x \, dx \right| \geq \int_{2\pi + 2k\pi}^{3\pi + 2k\pi} (2\pi + 2k\pi)^\alpha \sin x \, dx$$



$$= (2\pi(1+k))^\alpha \, 2 \geq 2\pi^\alpha \cdot 2 = \underline{\underline{4\pi^\alpha}}$$

$$[-\cos x]_{2\pi + 2k\pi}^{3\pi + 2k\pi} = -(-1) - (-(1)) = \underline{\underline{2}}$$

$\varepsilon = 4\pi^\alpha \qquad \forall b' \in (1, \infty)$

$x_1 = 2\pi + 2k\pi$

$x_2 = 3\pi + 2k\pi$

$\exists k$:)

$$b' < x_1 < x_2 < \infty$$

$$\int_{x_1}^{x_2} f \geq 4\pi^\alpha = \varepsilon \quad \Rightarrow \text{BC} \quad \int \underline{\underline{\mathrm{D}}} \ :)$$