BC podm.

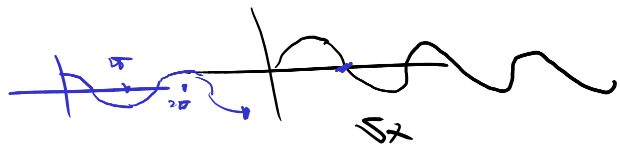
f spoj na $[a,b)$.

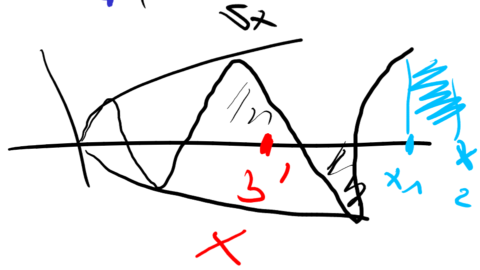
$$\int_a^b f \quad D \iff \exists \varepsilon > 0 \quad \forall b' \in (a,b)$$

$$\exists x_1, x_2 \quad b' < x_1 < x_2 < b :$$

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

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





k sudé

$k\pi, (k+1)\pi$ $\quad (\pi, 2\pi) \quad 2\pi, 3\pi$

$$\left| \int_{k\pi}^{(k+1)\pi} \underbrace{x^\alpha \sin x}_{\geq 0} \, dx \right| \geq \int_{k\pi}^{(k+1)\pi} (k\pi)^\alpha \sin x \, dx =$$

$$= (k\pi)^\alpha \left[-\cos x \right]_{k\pi}^{(k+1)\pi} = (k\pi)^\alpha \left(-(-1) - (-1) \right) = 2(k\pi)^\alpha \underset{k \geq 1}{\geq} 2\pi^\alpha$$

Zvolme $\varepsilon = 2\pi^\alpha$ $\quad \forall b' \in (1, \infty)$

zvolme $x_1 = k\pi$ $\quad$ k sudé, dost velké

$x_2 = (k+1)\pi$

pak $\displaystyle\left| \int_{x_1}^{x_2} f \right| \geq 2\pi^\alpha = \varepsilon.$ Z BC podm.

$\rightarrow$ divergence.