$\boxed{3757}$ $I(\alpha) = \int_1^{\infty} x^{\alpha} e^{-x}\,dx \quad , \quad a \le \alpha \le b$

$D_I = (-\infty, \infty)$

WK: $\int_1^{\infty} x^{\alpha} e^{-x}\,dx \overset{\forall \alpha \in [a,b]}{\le} \int_1^{\infty} x^{b} e^{-x}\,dx < +\infty \Rightarrow$

$\Rightarrow \quad I \overset{[a,b]}{\rightrightarrows}$

$\boxed{3762}$ $I(\alpha) = \int_0^{\infty} \sqrt{\alpha}\, e^{-\alpha x^2}\,dx \quad (0 \le \alpha < +\infty)$

$D_I = \mathbb{R}_0^+$

$\int_0^{\infty} \sqrt{\alpha}\, e^{-\alpha x^2}\,dx \overset{\alpha > 0}{=} \left| x = \frac{y}{\sqrt{\alpha}} \right| = \int_0^{\infty} e^{-y^2}\,dy = \text{const} > 0$

$I(0) = 0 \quad \# \quad \Rightarrow \quad I \overset{(0,0)}{\not\rightrightarrows}$

$\lim_{\alpha \to 0^+} I(\alpha) = \text{const}$

inak: $\int_A^{\infty} \sqrt{\alpha}\, e^{-\alpha x^2}\,dx = \left| x = y/\sqrt{\alpha} \right| =$

$= \int_{A\sqrt{\alpha}}^{\infty} e^{-y^2}\,dy \xrightarrow[\alpha \to 0^+]{\forall A > 0} \int_0^{\infty} e^{-y^2}\,dy \not< \varepsilon \Rightarrow$

$\overset{\text{Def.}}{\Rightarrow} \quad I \overset{(0,0)}{\not\rightrightarrows}$

$\boxed{3764}$ $$F(x)=\int_0^\infty \sin x\, e^{-x^2(1+y^2)}\,dy = \quad (x\in\mathbb{R})$$

$$= \sin x\, e^{-x^2}\int_0^\infty e^{-x^2y^2}\,dy \qquad (D_F=\mathbb{R})$$

$$\forall\ \underline{x>0}:\ \int_0^\infty e^{-x^2y^2}\,dy = \left| y=\frac{z}{x}\right| = \int_0^\infty \frac{1}{x}e^{-z^2}\,dz$$

$$\left.\begin{array}{l} F(0)=0 \quad \neq \\ F(x)=\dfrac{\sin x}{x}e^{-x^2}\displaystyle\int_0^\infty e^{-z^2}\,dz \xrightarrow{x\to 0} \int_0^\infty e^{-z^2}\,dz \end{array}\right\} \Rightarrow F \overset{O(0)}{\not\rightrightarrows}$$

<u>inak:</u>

$$\int_A^\infty \sin x\, e^{-x^2} e^{-x^2y^2}\,dy \overset{x>0}{=} \left| y=\frac{z}{x}\right| =$$

$$= \frac{1}{x}\sin x\, e^{-x^2}\int_{Ax}^\infty e^{-z^2}\,dz \xrightarrow[x\to 0+]{\forall A>0} \int_0^\infty e^{-z^2}\,dz \not< \varepsilon$$

$$\Downarrow \text{def.}$$

$$F \overset{O(0)}{\not\rightrightarrows}$$

$\boxed{3768}$ $$J(\mu)=\int_0^1 \sin\frac{1}{x}\cdot\frac{dx}{x^\mu} \qquad (0<\mu<2)$$

$$\int_0^\varepsilon \sin\frac{1}{x}\,x^{-\mu}\,dx = \left|\frac{1}{x}=y\right| = \int_{1/\varepsilon}^\infty \sin y\cdot y^\mu\cdot\frac{1}{y^2}\,dy =$$

$$= \int_{1/\varepsilon}^\infty \sin y\cdot y^{\mu-2}\,dy \quad (\text{mi} \to \text{ALE}):$$

$$r,q\in O(0):\ \Delta(r,q)=\int_r^q \sin\frac{1}{x}\,x^{-\mu}\,dx = \int_{1/q}^{1/r}\sin y\cdot y^{\mu-2}\,dy$$

potom :

$$\left|\Delta\left(\frac{1}{k\pi}, \frac{1}{(k+1)\pi}\right)\right| \xrightarrow[n\to 2^-]{\forall k\in\mathbb{N}} \left|\int_{k\pi}^{(k+1)\pi} \sin y \, dy\right| = 2 \not< \varepsilon$$

C-B $\Rightarrow$ $\overset{O(2)}{\not\exists}$ J