939.c.

$$V = \iint_{R^2} e^{-(x^2+y^2)} \cos(x^2+y^2)\,dxdy$$

$$|V| \le \iint_{R^2} e^{-(x^2+y^2)} \left|\cos(x^2+y^2)\right| dxdy \le \iint_{R^2} e^{-(x^2+y^2)}\,dxdy$$

$$\iint_{R^2} e^{-(x^2+y^2)}\,dxdy = \left[\begin{array}{ll} x = r\cos v & dxdy = r\,dr\,dv \\ y = r\sin v & \\ D_{rv} = \{(r,v) :\ 0 \le r,\ 0 \le v \le 2\pi\} & \end{array}\right] = \iint_{D_{rv}} e^{-r^2}\,r\,dr\,dv$$

$$\iint_{D_{rv}} e^{-r^2}\,r\,dr\,dv = 2\pi \int_{r=0}^{\infty} e^{-r^2}\,r\,dr = \pi\left[-e^{-r^2}\right]_{r=0}^{\infty} = \pi$$

$$|V| \le \pi$$

$$\text{Integralen} \quad V = \iint_{R^2} e^{-(x^2+y^2)} \cos(x^2+y^2)\,dxdy \quad \text{är konvergent} .$$

$$V = \left[\begin{array}{ll} x = r\cos v & dxdy = rdrdv \\ y = r\sin v & \\ D_{rv} = \left\{(r,v) :\ 0 \le r,\ 0 \le v \le 2\pi\right\} & \end{array}\right] = \iint_{D_{rv}} e^{-r^2} \cos(r^2)\,rdrdv$$

$$V = 2\pi \int_{r=0}^{\infty} e^{-r^2} \cos(r^2)\,rdr = \left[\begin{array}{l} t = r^2 \\ dt = 2rdr \end{array}\right] = \pi \int_{t=0}^{\infty} e^{-t} \cos t\,dt$$

$$V = \pi \left[\frac{e^{-t}}{2}(-\cos t + \sin t)\right]_{t=0}^{\infty} = \frac{\pi}{2}$$