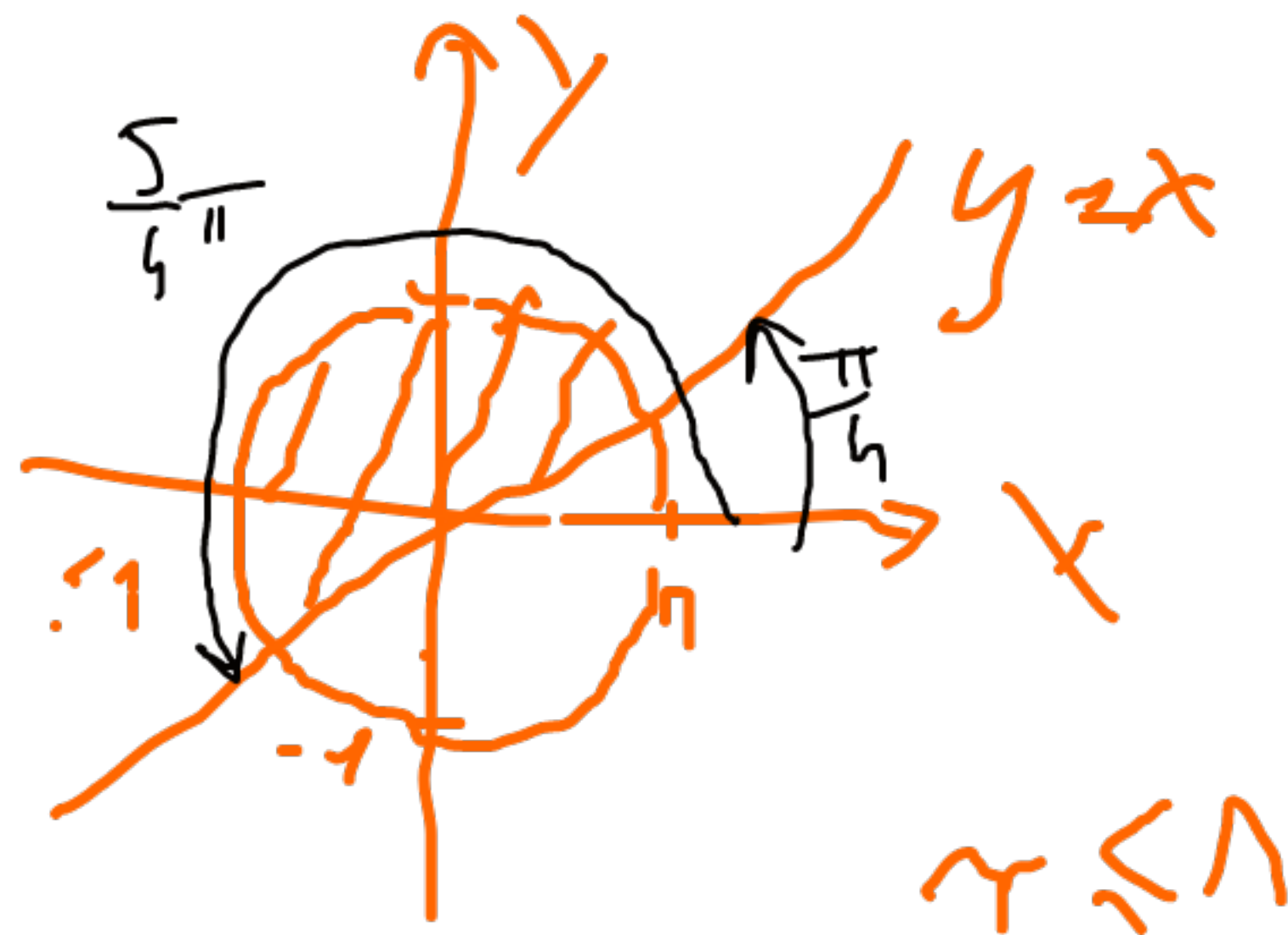


$$\iint_D y^2 e^{x^2+y^2} dx dy$$



$$r \leq 1$$

$$\varphi \in \left[\frac{\pi}{4}, \frac{5\pi}{4} \right]$$

$$D = \{ x^2 + y^2 \leq 1, \underbrace{y \geq x}_{(r \geq 0)} \}$$

$$\begin{cases} x = r \cos \varphi \\ y = r \sin \varphi \end{cases} \quad (r \geq 0)$$

$$dx dy = r dr d\varphi$$

$$x^2 + y^2 = r^2 \cos^2 \varphi + r^2 \sin^2 \varphi = r^2$$

$$\int_0^1 \int_{\frac{\pi}{4}}^{\frac{5\pi}{4}} (r \sin \varphi)^2 e^{r^2} r d\varphi$$

$$\int \sin^2 \varphi d\varphi$$

$$(r \sin \varphi)^2 e^{r^2} r d\varphi$$

$$\sin^2 \varphi = \frac{1 - \cos 2\varphi}{2}$$