

6.27.

Sätt:

$$\begin{aligned} \frac{x}{2} &= r \cos \theta \\ \frac{y}{3} &= r \sin \theta \end{aligned} \quad D_{r\theta} : \quad \begin{array}{l} r : 0 \quad 1 \\ \theta : 0 \quad 2\pi \end{array} \quad dxdy = 2 \cdot 3 \cdot r dr d\theta$$

$$I = \int_D (x^2 + y^2) dxdy = \int_{D_{r\theta}} r^2 (4 \cos^2 \theta + 9 \sin^2 \theta) 6r dr d\theta$$

$$I = 6 \int_{r=0}^1 \left(4 \frac{1}{2} 2\pi + 9 \frac{1}{2} 2\pi \right) r^3 dr = 6 \cdot 13\pi \cdot \frac{1}{4} = \frac{39\pi}{2}$$

SVAR:

$$\int_D (x^2 + y^2) dxdy = \frac{39\pi}{2}$$