$$\iint_D xy^2\,dx\,dy =$$

$$D = \{(x,y):\ x^2+y^2 \le 4y\}$$

$$\begin{cases} x = r\cos\varphi \\ y = r\sin\varphi \end{cases} \quad (r \ge 0,\ \varphi \in [0, 2\pi])$$

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

$$= \int_0^2 dr \int_0^{2\pi} r\cos\varphi \cdot (r\sin\varphi)^2 \cdot r\,d\varphi =$$

$$= \begin{cases} t = \sin\varphi \\ dt = \cos\varphi\,d\varphi \end{cases} \Bigg| = \int_0^2 dr \int_0^0 r^4 \cdot t^2\,dt = 0$$

$$\int \cos\varphi \sin^2\varphi\,d\varphi = \int t^2\,dt = \frac{t^3}{3} + C = \frac{\sin^3\varphi}{3} + C$$