

$$\begin{aligned}\int_C 3y^3 dx - 3x^3 dy &= 3 \iint_D \left[\frac{\partial}{\partial x} (-x^3) - \frac{\partial}{\partial y} (y^3) \right] dA \\ &= 3 \iint_D (-3x^2 - 3y^2) dA \\ &= 3 \int_0^{2\pi} \int_0^2 (-3r^2) r dr d\theta \\ &= -9 \int_0^{2\pi} d\theta \int_0^2 r^3 dr = -9(2\pi)(4) = -72\pi\end{aligned}$$