$\mathbf{F}(x, y) = \langle y^2 \cos x, x^2 + 2y \sin x \rangle$ and the region D enclosed by C is given by $\{(x, y) \mid 0 \leq x \leq 4, 0 \leq y \leq 3x\}$. C is traversed clockwise, so $-C$ gives the positive orientation.

$$\begin{aligned}
\int_C \mathbf{F} \cdot d\,\mathbf{r} &= -\int_{-C} (y^2 \cos x)\, dx + (x^2 + 2y \sin x)\, dy \\
&= -\iint_D \left[\frac{\partial}{\partial x}\left(x^2 + 2y \sin x\right) - \frac{\partial}{\partial y}\left(y^2 \cos x\right)\right] dA \\
&= -\iint_D (2x + 2y \cos x - 2y \cos x)\, dA = -\int_0^4 \int_0^{3x} 2x\, dy\, dx \\
&= -\int_0^4 2x \left[\, y \,\right]_{y=0}^{y=3x} dx = -\int_0^4 6x^2\, dx = -2x^3\Big]_0^4 = -128
\end{aligned}$$