

$$1. \quad r(t) = (0, 1) + (3-1, 2-0)t \\ = \langle 2t, 2t+1 \rangle$$

$$r'(t) = \langle 2, 2 \rangle$$

$$\int_C xy \, dt = \int_0^1 (2t)(2t+1) 2 \, dt \\ = \left. \frac{8x^3 + 6x^2}{3} \right|_0^1 \\ = \frac{14}{3}$$

$$2. \quad \int_C xy^2 \, dx + x^2y \, dy$$

$$\int_0^1 (t^2)(t^6) 2t \, dt + (t^4)(t^3)(3t^2) \, dt \\ = \left. \frac{t^{10}}{2} \right|_0^1 \\ = \frac{1}{2}$$

