

$$\int_C x^4 y \sqrt{z} \, dz = \int_0^1 (t^5)^4(t) \sqrt{t^2} \cdot 2t \, dt = \int_0^1 2t^{23} \, dt = \left. \frac{1}{12} t^{24} \right|_0^1 = \frac{1}{12}$$