

1. Evaluate the line integral $\int_C xy^4 ds$ where C is the right half of the circle $x^2 + y^2 = 25$ (i.e., the part of the circle with $x \geq 0$).

2. Let $\mathbf{F} = x^2y^3\mathbf{i} - y\sqrt{x}\mathbf{j}$ and let C be the curve given by $\mathbf{r}(t) = t^2\mathbf{i} - t^3\mathbf{j}$ for $0 \leq t \leq 1$. Compute the line integral

$$\int_C \mathbf{F} \cdot d\mathbf{r}.$$