Calculus III (Math 241)

Problems

1. Evaluate the line integral

$$\int_C (y+z)\,dx + (x+z)\,dy + (x+y)\,dz,$$

where C consists of the line segment from $(0,0,0)$ to $(1,0,1)$, followed by the line segment from $(1,0,1)$ to $(0,1,2)$.

2. Evaluate the line integral

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

where

$$\mathbf{F}(x,y) = xy^2\,\mathbf{i} - x^2\,\mathbf{j}, \quad \mathbf{r}(t) = t^3\,\mathbf{i} + t^2\,\mathbf{j}, \quad 0 \le t \le 1.$$