

Name:

1. Evaluate the line integral  $\int_C \frac{x}{y} ds$  where  $C : x = t^3, y = t^4, 1 \leq t \leq 2$ .

2. Evaluate the line integral  $\int_C xy^4 ds$  where  $C$  is the right half of the circle  $x^2 + y^2 = 16$ .

3. Evaluate the line integral  $\int_C \mathbf{F} \cdot d\mathbf{r}$  where  $C$  is given by the vector function  $\mathbf{r}(t)$ .

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

(b)  $\mathbf{F}(x, y, z) = \sin x\mathbf{i} + \cos y\mathbf{j} + xz\mathbf{k}$ ,  $\mathbf{r}(t) = t^3\mathbf{i} - t^2\mathbf{j} + t\mathbf{k}$ ,  $0 \leq t \leq 1$ .