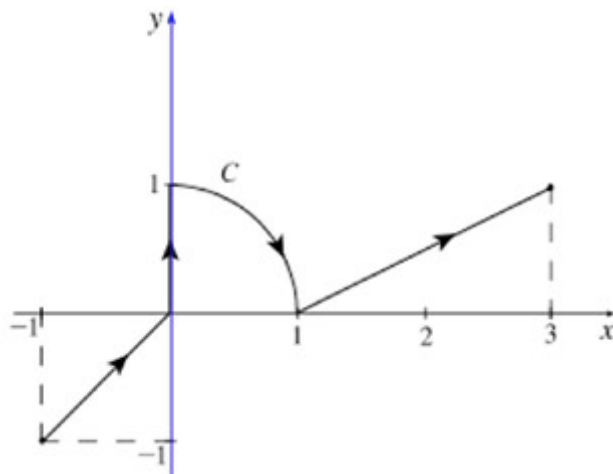
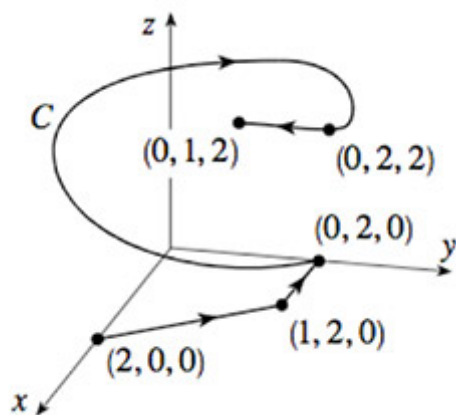


## [13.3] - Think before you compute

1. Compute  $\int_C (ye^{xy} \hat{\mathbf{i}} + xe^{xy} \hat{\mathbf{j}}) \cdot d\vec{\mathbf{r}}$  for the curve  $C$  shown below.



2. Compute  $\int_C (yz^2 \hat{\mathbf{i}} + xz^2 \hat{\mathbf{j}} + 2xyz \hat{\mathbf{k}}) \cdot d\vec{\mathbf{r}}$  for the curve  $C$  shown below.



3. Let  $\vec{\mathbf{F}}(x, y) = (2x + y) \cos(x^2 + xy) \hat{\mathbf{i}} + (x \cos(x^2 + xy) + 1) \hat{\mathbf{j}}$ .

a. Show that  $\vec{\mathbf{F}}$  is a conservative vector field.

b. Let  $C$  be the curve parameterized by  $\vec{\mathbf{r}}(t) = \sin t \hat{\mathbf{i}} + (1 - \cos t) \hat{\mathbf{j}}$  with  $0 \leq t \leq \pi$ .

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