1. Compute $\int_C (6xy\vec{i} + 3x^2\vec{j}) \cdot d\vec{r}$ for a path beginning at (3, 0) and ending at (0, -3).

2. Compute $\int_C \langle y^2, xy \rangle \cdot d\vec{r}$ for a path C given by $\vec{r}(t) = \langle 2 + 3t, 1 - 5t \rangle$ for $0 \le t \le 1$.

1. Compute $\int_C \vec{F} \cdot d\vec{r}$ for the vector field $\vec{F}(x,y) = \langle 2xy, x^2 - 6y \rangle$ and with C the sinusoidal path

beginning at (3, 0) and ending at (-3, 0) and performing 17 complete oscillations on this interval.

2. Compute $\int_C \vec{F} \cdot d\vec{r}$ for the vector field $\vec{F}(x,y) = x^2 y \, \vec{i} + y^3 \, \vec{j}$ and with C an arc of a circle

(centered at the origin) of radius 3 passing counterclockwise through the first and second quadrants.