

## 17.3: Evaluating Line Integrals

### Calculus III

College of the Atlantic. Winter 2016

Consider the vector field:

$$\vec{F}(x, y) = -y\vec{i} + x\vec{j} \quad (1)$$

1. Sketch the vector field in the first quadrant.

2. Evaluate:

$$\int_{C_1} \vec{F} \cdot d\vec{r}, \quad (2)$$

where  $C_1$  is the quarter-circle of radius 2 centered at the origin that starts at  $(2, 0)$  and ends at  $(0, 2)$ .

3. Evaluate:

$$\int_{C_2} \vec{F} \cdot d\vec{r}, \quad (3)$$

where  $C_2$  the line segment that starts at  $(2, 0)$  and ends at the origin.

4. Evaluate:

$$\int_{C_3} \vec{F} \cdot d\vec{r}, \quad (4)$$

where  $C_3$  the line segment that starts at the origin and ends at  $(0, 2)$ .

5. Evaluate:

$$\int_{C_4} \vec{F} \cdot d\vec{r}, \quad (5)$$

where  $C_4$  the line segment that starts at  $(2, 0)$  and ends at  $(0, 2)$ .