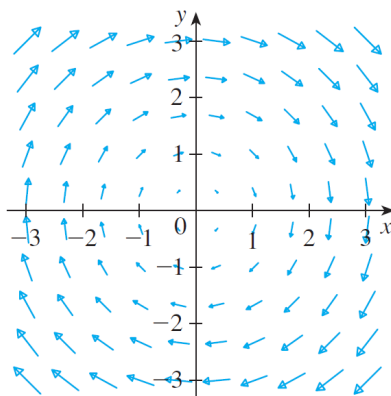


Exercise 17

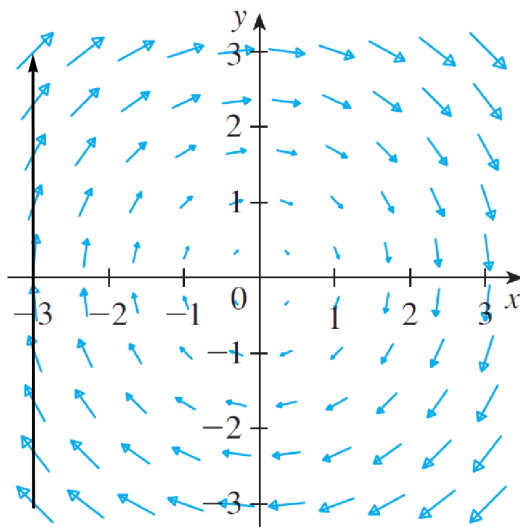
Let \mathbf{F} be the vector field shown in the figure.

- (a) If C_1 is the vertical line segment from $(-3, -3)$ to $(-3, 3)$, determine whether $\int_{C_1} \mathbf{F} \cdot d\mathbf{r}$ is positive, negative, or zero.
- (b) If C_2 is the counterclockwise-oriented circle with radius 3 and center the origin, determine whether $\int_{C_2} \mathbf{F} \cdot d\mathbf{r}$ is positive, negative, or zero.



Solution

Because the path goes upward in the direction that the vector field is pointing, $\int_{C_1} \mathbf{F} \cdot d\mathbf{r}$ is positive.



Because the path goes counterclockwise against the direction that the vector field is pointing, $\int_{C_2} \mathbf{F} \cdot d\mathbf{r}$ is negative.

