1   Circulation I

None

The *circulation* of a vector field $\vec{F}$ around a closed curve C is given by

$$\oint_C \vec{F} \cdot d\vec{r}$$

For each of the vector fields below, explain whether you expect the given vector field to have positive, negative, or zero circulation *counterclockwise* around the closed curve C in the figure shown above. Two of the segments of C are circular arcs centered at the origin; the other two are radial line segments.

I. $\vec{G} = x\,\hat{x} + y\,\hat{y}$

II. $\vec{H} = y\,\hat{x} - x\,\hat{y}$