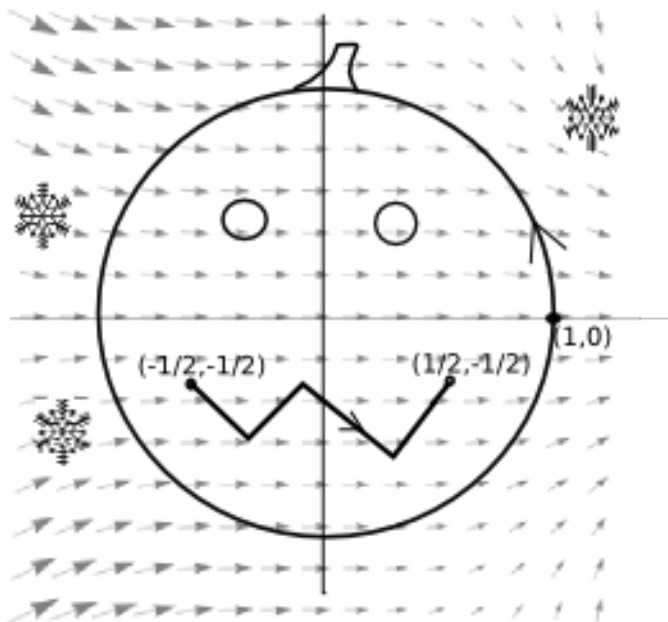


Math 120: Quiz 1

Time limit: 20 mins



Let the vector field representing the blizzard be $\vec{F}(x, y) = \langle 1 - y \sin(xy), -x \sin(xy) \rangle$.

1. Is \vec{F} conservative? [2 points]
2. Evaluate the line integral $\int_{C_1} \vec{F} \cdot d\vec{r}$ where C_1 is the path from $(-1/2, -1/2)$ to $(1/2, -1/2)$ as shown above. [4 points]
3. Evaluate the line integral $\int_{C_2} \vec{F} \cdot d\vec{r}$ where C_2 is the circle of radius 1 centered at the origin oriented counter-clockwise. [1 point]
4. Suppose a gust of wind changes the vector field \vec{F} to a new vector field $\vec{G} = \vec{F} + \langle y, 0 \rangle$. Evaluate the line integral

$$\int_{C_2} \vec{G} \cdot d\vec{r}$$

where C_2 is the same circle as above. [3 points]