

QUIZ, MARCH 28TH

NAME:

Spherical Integration. Set up an integral which computes the volume of the region drawn below:

Line Integrals I. Compute the integral of the function $f(x, y) = x + y$ over the curve

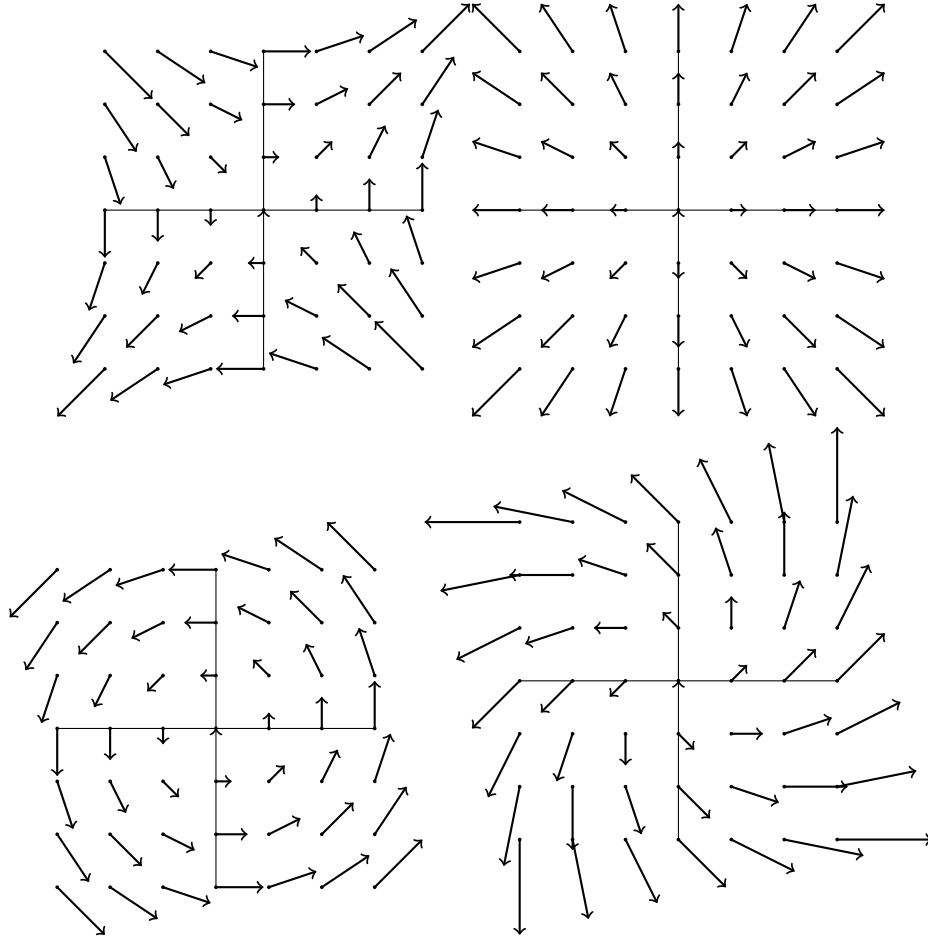
$$x(t) = t$$

$$y(t) = t$$

as t goes from 0 to 1.

Identify the Vector Field.

- A $\langle x, y \rangle$
- B $\langle -y, x \rangle$
- C $\langle x - y, x + y \rangle$
- D $\langle y, x \rangle$



Bonus Problem. Let $C(t) = (r(t) : \theta(t))$ be a polar parameterized curve, with $r(t) > 0$ and $C(0) = C(1)$. Consider the vector field $\vec{F} = \langle y/(x^2 + y^2), -x/(x^2 + y^2) \rangle$. Show that

$$\int_C \vec{F} \cdot dr$$

counts the number of times that the curve C winds around the origin.