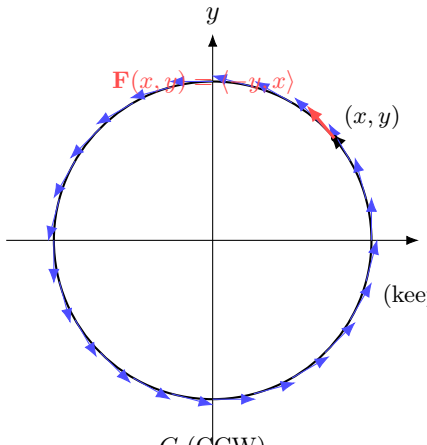
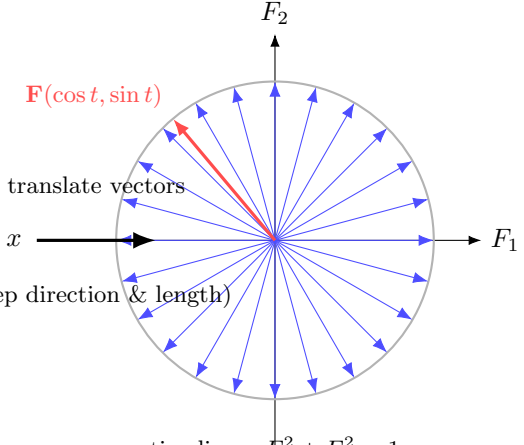
A. Field vectors attached on $C:\ x^2+y^2=1$ **B. Stack tails at the origin (hodograph)** **C. Green's Theorem: boundary circulation = area curl**

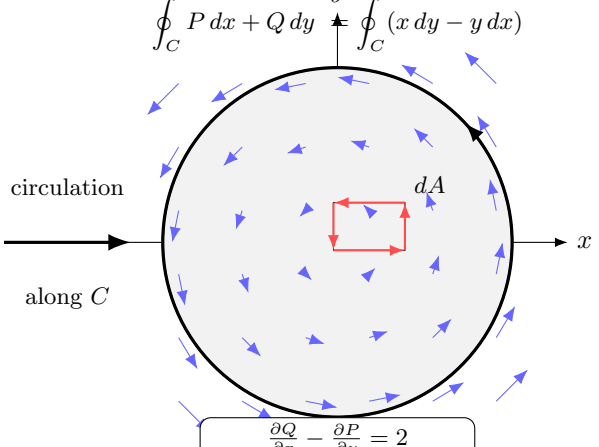


Tangent vectors; $\|\mathbf{F}\| = 1$ on C.



tips lie on $F_1^2 + F_2^2 = 1$

Set $\{\mathbf{F}(x,y) : (x,y) \in C\}$ is a circle.



$$x\,dy - y\,dx = (-y)\,dx + x\,dy \text{ so } P = -y,\ Q = x. \quad \tfrac{\partial Q}{\partial x} = 1,\ \tfrac{\partial P}{\partial y} = -1 \Rightarrow \tfrac{\partial Q}{\partial x} - \tfrac{\partial P}{\partial y} = 2.$$

$$\text{For the unit disk } D\text{: } \oint_C x\,dy - y\,dx = \iint_D 2\,dA = 2\pi.$$