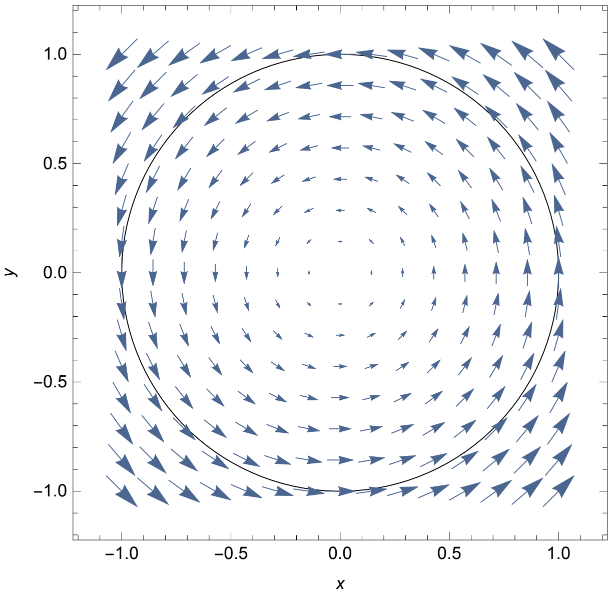
For each of these linear vector fields, the divergence of F and the curl of F are constant functions. The curl of F is a constant times k-hat, so curl_z F is that constant.

The flux of F out through the circle is the divergence of F times the area of the disk, and the circulation of F around the circle is curl_z F times the area of the disk.

F(x, y) = {-y, x}

div F = 0, curl_z F = 2

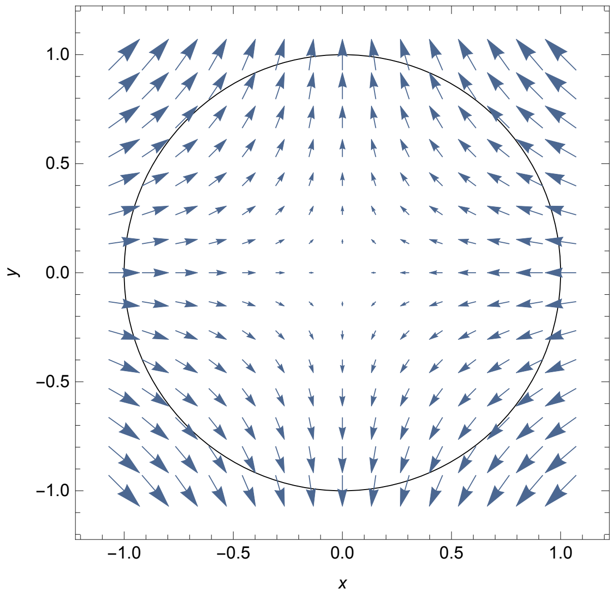
Out[ ]=



```
F(x, y) = {-x, y}

div F = 0, curl_z F = 0
```

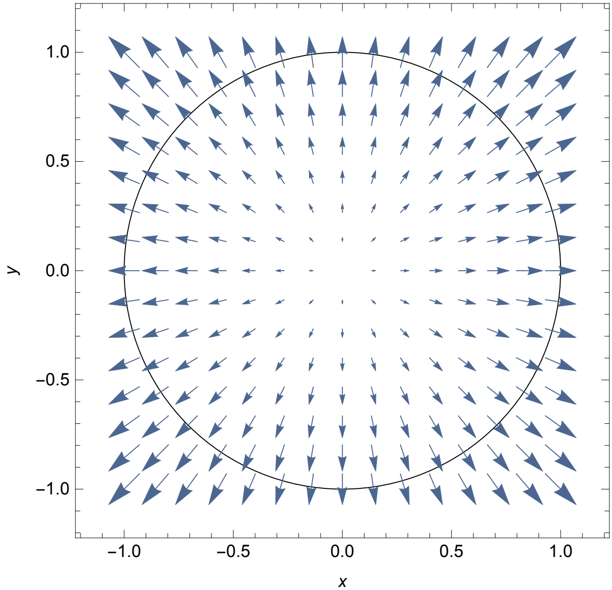
Out[ ]=



```
F(x, y) = {x, y}

div F = 2, curl_z F = 0
```

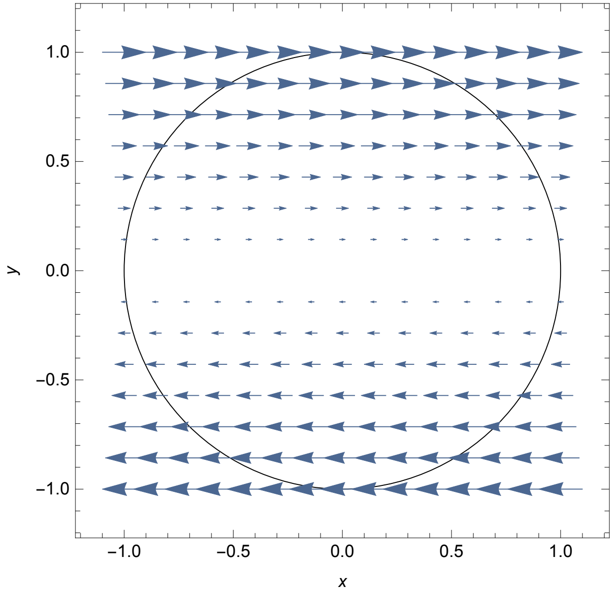
Out[•]=



```
F(x, y) = {y, 0}

div F = 0, curl_z F = -1
```

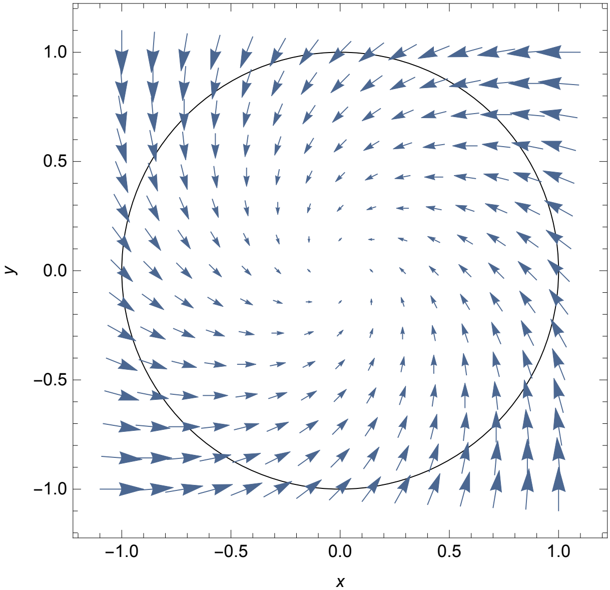
Out[•]=



```
F(x, y) = {-x - y, x - y}

div F = -2, curl_z F = 2
```

Out[•]=



F(x, y) = {2, 1}

div F = 0, curl_z F = 0

Out[ ]=