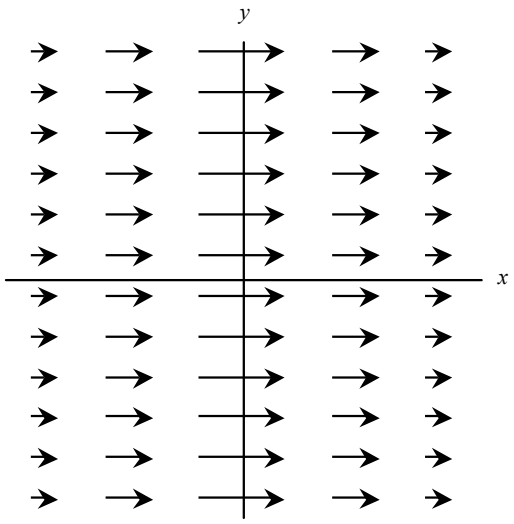
Conservative force fields Name _____

Each of the four (4) diagrams below and on the reverse side of this page represents a *vector field* $\vec{F}(x, y)$ mapped in the *x*-*y* plane. (That is, each map depicts a vector quantity whose magnitude and direction vary with *x* and *y*.) For each vector field shown, answer the following two questions:

i. Is the curl of that vector field equal to *zero* everywhere in the *x*-*y* plane? Explain how you can tell.

ii. If that vector field represented a force, would the force be *conservative* or *non-conservative?* Explain your reasoning.

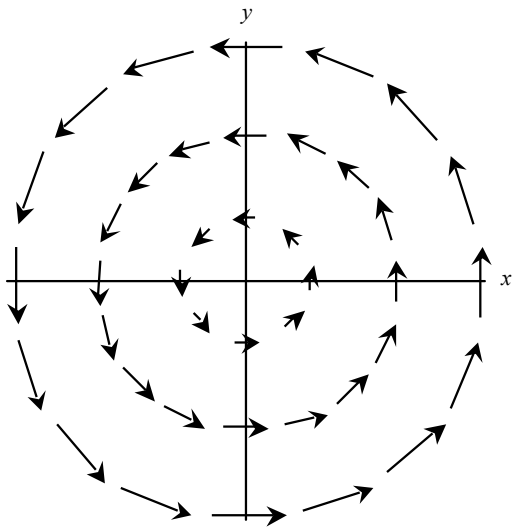
Case #1



i. Is curl $\vec{F}(x, y) = 0$ everywhere? Explain.

ii. Conservative or non-conservative? Explain.

Case #2

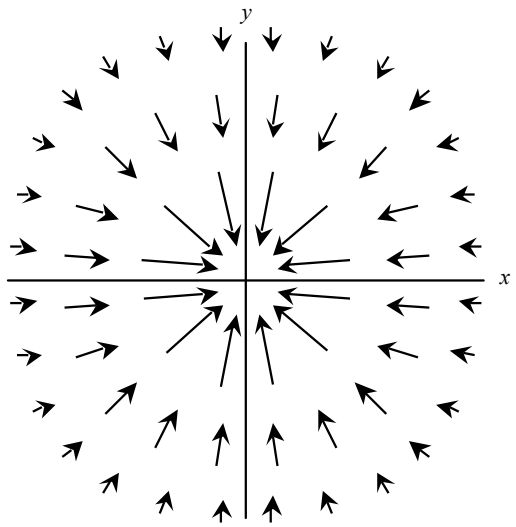


i. Is curl $\vec{F}(x, y) = 0$ everywhere? Explain.

ii. Conservative or non-conservative? Explain.

(continued on other side)

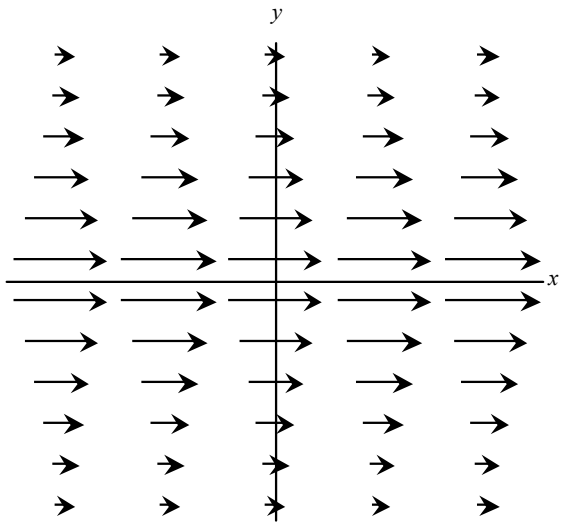
Case #3



i. Is curl $\vec{F}(x, y) = 0$ everywhere? Explain.

ii. Conservative or non-conservative? Explain.

Case #4



i. Is curl $\vec{F}(x, y) = 0$ everywhere? Explain.

ii. Conservative or non-conservative? Explain.