

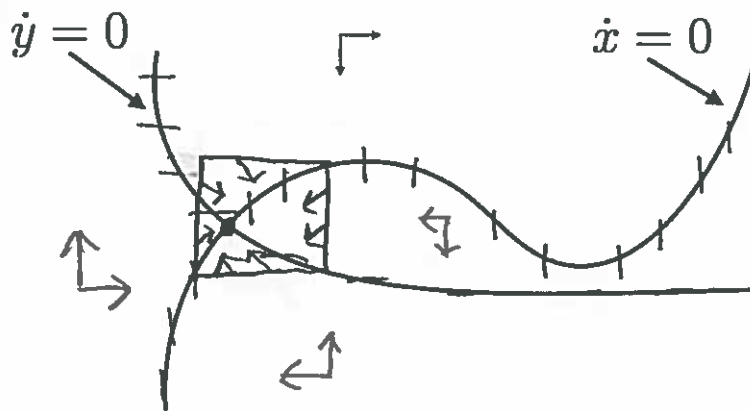
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Quiz #3

The figure shown below contains the two nullclines of the system

$$\begin{cases} \dot{x} = f(x, y) \\ \dot{y} = g(x, y) \end{cases}$$

In one of the regions partitioned off by the nullclines, the overall direction of the vector field is indicated by two arrows.

1. In the figure, label all fixed points.
2. For each of the regions in the phase plane separated by the nullclines, indicate the overall direction of the vector field.
3. Construct a trapping region for this system.
4. What do you need to assume about the fixed point(s) in order to conclude the existence of a limit cycle?



If the fixed point is unstable PBT implies the existence of a stable limit cycle.