

③ Consider the ODE

$$\begin{cases} \dot{x} = y \\ \dot{y} = -x \end{cases}$$

- Solve this ODE for arbitrary $x(0), y(0)$ analytically
- Find the constant of motion
- Plot a solution for a given $x(0), y(0)$
Plot the constant of motion for $x(0), y(0)$
Do they coincide?
- Solve the ODE with the same $x(0), y(0)$ using NDSolve and compare with previous results.