$$\left.\begin{aligned}\dot{x} &= x + y \\ \dot{y} &= 4x - 2y \\ (x,y)_{t=0} &= (2,-3)\end{aligned}\right\} \begin{matrix}\tau = -1 \\ \Delta = -6\end{matrix} \rightarrow \begin{cases}\lambda_1 = 2 \\ \lambda_2 = -3\end{cases} \qquad \vec{v}_1 = \begin{pmatrix}1\\1\end{pmatrix} \quad \vec{v}_2 = \begin{pmatrix}1\\-4\end{pmatrix}$$

$$\vec{x}(t) = c_1\begin{pmatrix}1\\1\end{pmatrix}e^{2t} + c_2\begin{pmatrix}1\\-4\end{pmatrix}e^{-3t} \qquad \text{with } c_1 = c_2 = 1 \text{ from init. cond.}$$

Can draw phase portrait directly from eigenvalues & eigenvectors: