Problem 1. Consider equation \((\dot{x}, \dot{y}) = w(x, y)\). Find new coordinates \((u, v)\), taking this equation to the form
\[
\dot{u} = 1, \quad \dot{v} = 0
\]
near point \(P\):

(a) \(w = (1, 2), P = (0, 0)\);
(b) \(w = (x, 2y), P = (1, 1)\);
(c) \(w = (2x, y), P = (-2, 2)\);
(d) \(* w = (y, -x), P = (1, 0)\);

Problem 2. Rewrite the following systems in polar coordinates. Plot its phase portraits in new and old coordinates.

(a) \(\dot{x} = -y, \quad \dot{y} = x\);
(b) \(\dot{x} = y, \quad \dot{y} = -x\);
(c) \(\dot{x} = x - y, \quad \dot{y} = x + y\);