1. Laser Model

$\frac{dn}{dt} = GnN - kn$
$\frac{dN}{dt} = -GnN - fN + p$
Where G is the gain coefficient for stimulated emission, k is the decay rate due to loss of photons by mirror transmission/scattering, f is the decay rate for spontaneous emission, and p is the pump strength. All parameters are positive, except p. In this project, you will analyze the two-dimensional system displayed above. For simplicity, you may first reduce it to a single differential equation. Then, simulate the 2D system and analyze its stability, keeping in mind the physical significance of each parameter.