

**Problem 1:** (10 points) Consider the predator-prey system modeled by the equations

$$\begin{aligned}\frac{dR}{dt} &= 4R \left(1 - \frac{R}{4}\right) - 2RF \\ \frac{dF}{dt} &= -2F + RF.\end{aligned}$$

**Part (a):** Find all equilibrium solutions of the system.

**Part (b):** Draw part of the direction field for the system for  $R \geq 0$  and  $F \geq 0$ . Note that a few (semi-random) accurately calculated and reasonably accurately drawn arrows are all that is requested.

**Part (c):** A solution curve for the system corresponding to the initial condition  $(R(0), F(0)) = (1, 3)$  is pictured. Draw the  $R(t)$  and  $F(t)$  graphs for this solution curve.

