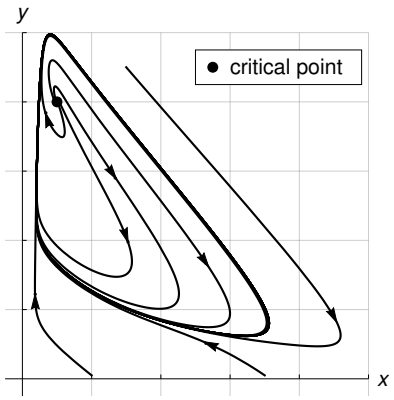
9. [14 points] The Brusselator is a nonlinear model of a chemical reaction which can have oscillatory concentrations x and y of the chemicals in the reaction. A model for this is

$$x' = 1 - (b+1)x + \frac{1}{4}x^2 y, \quad y' = bx - \frac{1}{4}x^2 y.$$

The figure to the right gives the phase portrait for this system for some value of b.



a. [4 points] What are the coordinates of the critical point shown? *(Note that your answer may involve the parameter b.)*

b. [7 points] Given the behavior shown in the phase portrait, what can you say about the parameter b?

c. [3 points] We said that the Brusselator can have oscillatory concentrations of x and y. Explain how the result here does (or does not) demonstrate this behavior.