

## Homework 8

Due: Friday November 6

1. Think about the example on pp. 243ff again. Consider the nullcline

$$y = \frac{1}{b} \frac{x^2}{1+x^2}.$$

a. Show that  $y$  is a strictly increasing function of  $x > 0$ . (Hint: You don't need calculus for this.)

b. Show that there is exactly one inflection point.

c. What does Fig. 8.1.4 become right *after* the bifurcation, when there is no nonzero fixed point any more? Draw the "bottleneck" region into your plot. Do trajectories that enter the bottleneck traverse it lengthwise, or do they escape laterally? What is the biological interpretation of the bottleneck?

2. p. 285, problem 8.1.6.

3. p. 285, problem 8.1.10.