ESAM 438
Interdisciplinary Nonlinear Dynamics

Fall 2000

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Problem Set 2

For Discussion Section October 11

1. **Problems from Strogatz**

   Do 3.1.1, 3.1.3, 3.2.4, 3.4.7, 3.4.11, 3.4.12.

2. **Population Growth with Eggs II**

   Consider again the dynamics of a population of animals that lay eggs and investigate numerically

$$\frac{dN}{dt} = -N(t) - N(t)^2 + \alpha N(t-\tau) - \beta N(t-\tau)^2. \tag{1}$$

   Explore what happens to the oscillating solution you found in the last homework if you keep increasing the delay τ from $\tau = 3$ in not too large steps to at least $\tau = 15$, with $\alpha = 17$ and $\beta = 3.7$ fixed.