

## MTH 337 Sample Quiz 4

You will have **15 minutes** to take the actual quiz.

1. Consider the follow population model

$$P(t+1) = a(M^2 - P(t)^2)P(t).$$

Perform a parameter reduction (similar to the project prompt) to reduce the number of parameters from 2 to 1.

2. Write a function to simulate the following predator-prey model for  $t \in [0, T]$ :

$$R(t+1) = (a - pF(t))R(t)F(t+1) = (qR(t) - b)F(t)$$

3. Describe what a bifurcation diagram is? What does it tell you about the model?