# Worksheet 8: Section 2.9

June 12, 2017

Name: _____

**Assignment:** Read section 2.9, and watch the 'Day 8 Videos' posted to the Canvas site. The last few questions on this sheet will come from the end of the videos.

# 1   Section 2.9

1. What is the general form of a first order difference equation?

2. Why might one use a finite difference equation instead of a differential equation?

3. What do solutions for finite difference equations look like?

4. If we have an autonomous finite difference equation, how can we look for equilibrium solutions?

5. For what range of parameter $w$ is the linear difference equation

$$y_{n+1} = (w + 1)y_n$$

stable?

6. The logistic difference equation has two equilibrium solutions, $u_n = 0$ and $u_n = \frac{\rho - 1}{\rho}$. What do we mean by an **exchange of stability** and where does it happen?

7. What is the definition of a **bifurcation**?

8. What are the defining properties of **chaotic** solutions?