LECTURE SUMMARY 8

WEDNESDAY, JUN 29, 2016

Autonomous Differential Equations and Equilibrium Solutions

1. Autonomous differential equations.
2. Equilibrium solutions.
3. Stability of equilibrium value.
4. Examples using MATLAB to show direction fields.
5. Examples of finding equilibrium solutions and assess the stability of each.
6. Theorem of determine stability of equilibrium values.
7. Convexity and Concavity.
8. Inflection points.
9. $y'' = f'(y)f(y)$.

Applications: Logistic Growth Model and Logistic Growth Model with a Threshold

1. $y' = ky(1 - \frac{y}{L})$, where $k, L > 0$.
2. $y' = ky(1 - \frac{y}{L})(\frac{y}{T} - 1)$, where $k > 0, 0 < T < L$.
3. Explain how the population grows/decreases and how those coincide with solutions of the models.