Lecture on Aug. 1st, 2017: Techniques and Applications of Differential Equations

1 Warm-up Practice

- Show that y defined implicitly by $y^2 - x^2 = C$ is the solution of $yy' = x$. Find an explicit expression for the particular solution that satisfies the initial condition $y(0) = 2$.

2 Techniques for solving differential equations

- Method of separation of variables.

- Examples of applying separation of variables.

- Definitions of first-order linear differential equations.

- Procedure to solve first-order linear differential equations.

- Examples of solving first-order linear differential equations.

3 Applications of differential equations

- Definitions of equilibrium and dynamically stable.

- Price stability example.

- Four types of exponential growth models: unlimited growth, exponential decay, limited growth and Logistic growth.