

**Semester Review**

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Variables, Formulas, Functions, Graphs

Introduction to Modelling

Euler's Method and Initial Value Problems

Slope Fields and Euler's Method

Euler's Method and Successive Approximation

Introduction to the S-I-R model

Euler's Method and the S-I-R Model

Qualitative Analysis of the S-I-R Model

Local Linearity and the Microscope Approximation

Differentiability and Linear Approximation

Review of Limits

The Definition of the Derivative

Elementary Derivatives and Rules of Differentiation

Taylor's Theorem

The Product Rule (and Quotient Rule)

Composition of Functions and the Chain Rule

Implicit Differentiation

Related Rates

Inverse Functions

Derivatives of Inverse Functions

L'Hopital's Rule

Indeterminate Forms

Population Models

More Population Models

Slope Functions and Equilibrium Values

Rate Equations and Inflection Points

Taylor's Theorem and Quadratic Approximations

Newton's Method

Introduction to Single Variable Optimization

Single Variable Optimization, Continued

Introduction to Multivariable Functions

Introduction to Partial Derivatives

Multivariable Optimization

On this side of this sheet write down a concept map of the most important concepts in the course.