

In this class:

- *The Newton method and how it works where bisection cannot!*
- *The Secant method and how it avoids needing the derivatives that Newton's requires.*
- *The fixed-point form of the nonlinear equation problem.*
- *List of topics*
- *Selected problems from HW*

November 30, 2016

Review

Next class

MIDTERM 3

Next next class

Topics 1

Background I assume

Linear algebra

Calculus

Differential equations

Discrete math

Programming

Probability

I'll try to remind you what you need to know

Topics we've covered

Week 10

Intro to Applied Math
Function representations
Polynomial interpolation
Lagrange polynomials
Barycentric form
Vandermonde matrix
Piecewise polynomials
ApproxFun

Week 11

Numerical differentiation
Truncation error for
numerical differentiation
Errors in forward difference
Errors in central difference

Combinations of floating
point error and
truncation error
Richardson extrapolation
Errors in polynomial
interpolation
High dimensional
polynomials

Week 12

Numerical integration
Quadrature
Trapezoidal rule
Composite trapezoidal
rules

Week 13

Ordinary differential

equations

Forward Euler
Local truncation error
Consistency
Convergence
Stability
Absolute stability
Backwards Euler
Runge-Kutta

Week 14

Nonlinear equations
Bisection
Newton's method
Secant method
Fixed Point methods