**Class 10** – **Root Finding – Bracketing Methods (Chp 5)**

ChE310\_Sec1\_F2019 / 9.26.19

<http://www.reuelgroup.org/numerical-methods-che-310.html>

Announcements:

Oct 1: Phase 1 (Memo to Reuel) / Oct3: Midterm 1 (posted help)

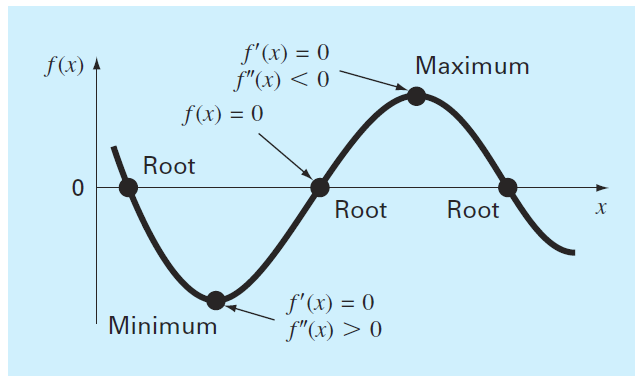
**Warm Up Group Activity:** submit to SLACK by 2:25pm

Practice with histograms:

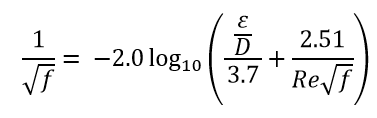
* Download univariate data ‘Dist.xlsx’ of rates
* Make a histogram with 8 bins. Label axes.
* Assume normal distribution. Fit PDF parameters.
* Simulate 5 random measurements from this PDF.
* Plot PDF on histogram
* What is probability of finding rate > 0.017?

**Outline for Class 10 Lecture**

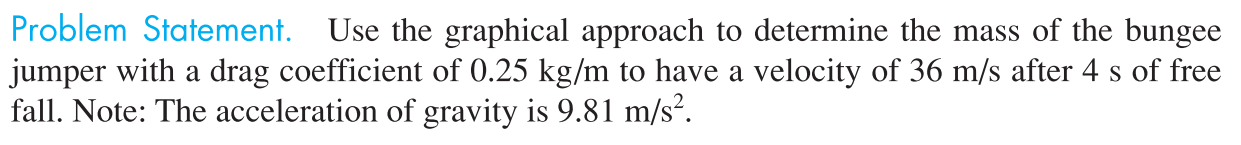
1. Root finding

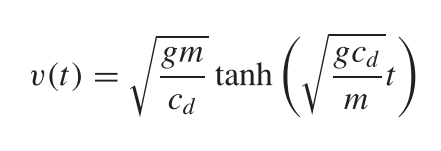


1. Example: implicit equations; solving for friction factor using Colebrook equation:

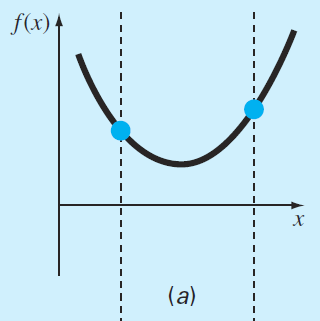
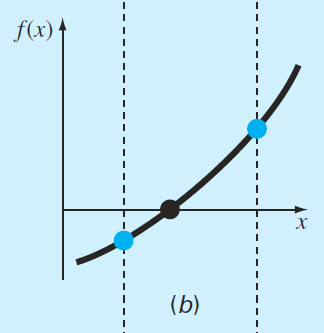


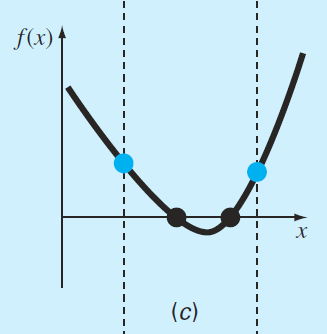
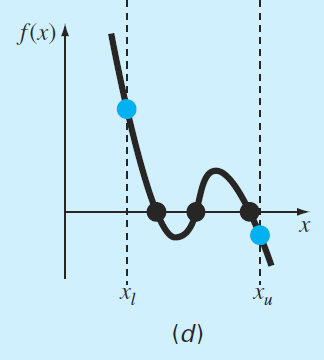
1. Graphical method (simple, not automated)



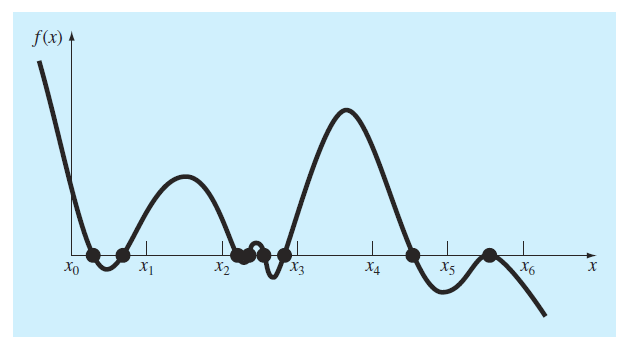


1. Bracketed vs. open methods
   1. String demo

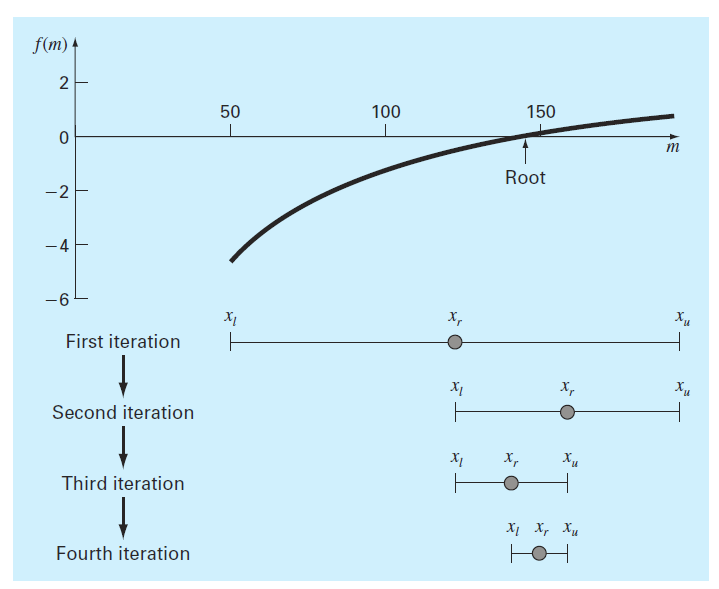
 

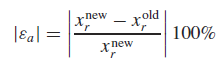
 

1. What ideas do you have to accomplish this?
2. Incremental search:



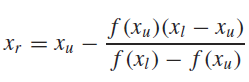
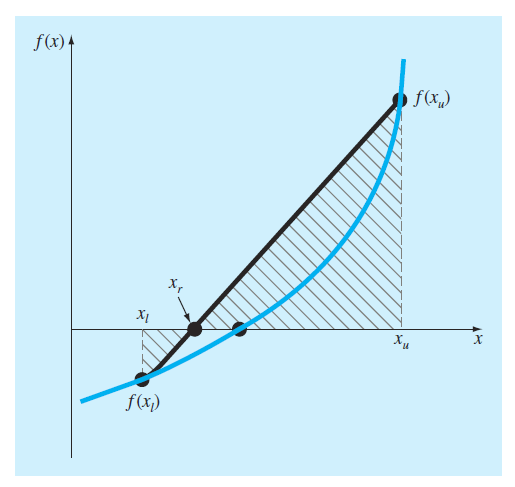
1. Bisection (Natl. Instrument Interview)



Objective Criterion: 

# Iterations: 

1. False Position



Examples: Problems 5.5, 5.6, and 5.20 from textbook.

1. Example of Excel Solver for root finding