

# Phys 305

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# Today's Lecture

- Announcements
  - Slideshow from URM Recruiting and Retention Task Force on opportunities for STEM undergrads posted to Course Notes on D2L, contact Victoria Jones ([vrjones@Arizona.edu](mailto:vrjones@Arizona.edu)) for more info
  - Problem Set 1 posted to D2L, **due 9/4/2020 at 5:00** (on D2L)
  - Homework Submission (pdf in Course Notes on D2L)
- Recap from last lecture's break-out
  - Prime factorization
- Algorithm: Root finding
- Algorithmic thinking break-out:
  - Root finding (problem set 1, problem 3)

# Homework Submission

- Create a separate file for each problem, the file name should include the problem set number and problem number
- Each file should contain a short high-level description, further comment your code as much as needed!
- Create a directory [your NETID]\_[PS#] and copy all files into that directory
- Create a tar file, and submit it on D2L

# Recap: Prime Factorization of integer n

*if m is a prime factor of n, the problem reduces to prime factorization of n/m*

- → recursive algorithm `factors(n)`, we're done if  $n=2$

`factors(n):`

`if (n == 2): print n, return`

`try integers m in range [2,ceil(sqrt(n))]`

`if n%m == 0:`

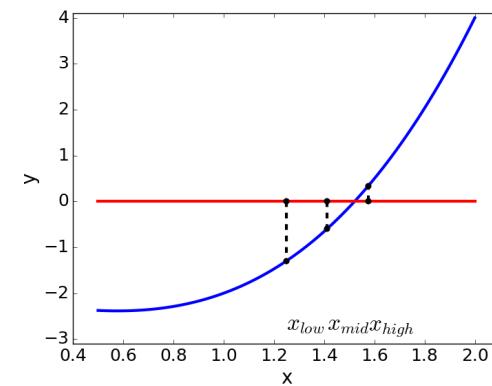
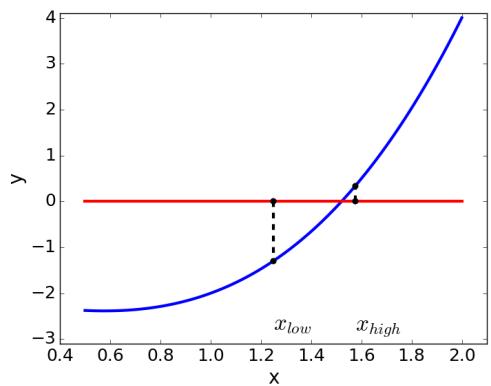
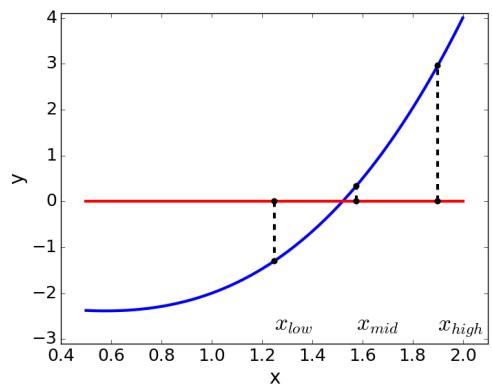
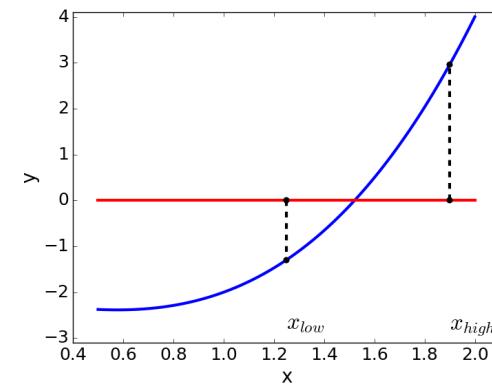
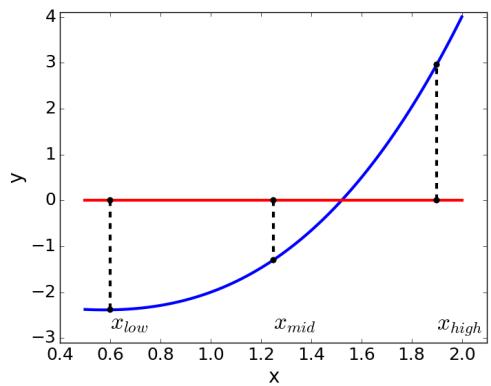
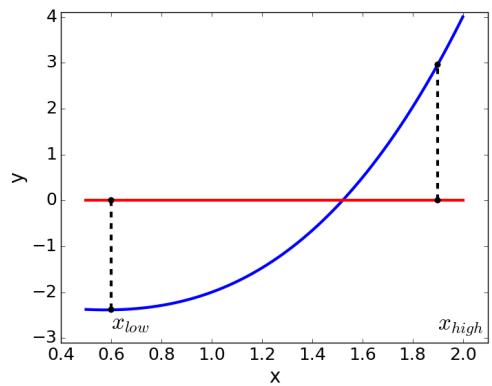
`m is prime factor, output it`

`return factors(n/m)`

`if no m worked, n must be prime`

# Root Finding

- RootFinding.pdf in Lecture Notes



# Your Turn: Root Finding

**Problem 3. [10 Points]** Use bisection to determine the root nearest  $x = 0$  of the function

$$f(x) = \tan(x) - 3$$

- 1) Break the problem up into different task (high-level abstraction)
- 2) Fill in more detailed steps for each task
- 3) Fill in equations for these steps, as time permit (use RootFinding.pdf on D2L)

We will split up into break-out rooms.

Each room designates a scribe, who will share their screen.

Jointly develop the algorithm – start at high level, then fill in detailed step (no code!)

Maria, Marco and I will circle through breakout rooms.

You can leave before end of class if your group finishes early.