Outline

• Syllabus
• Why math in economics?
Syllabus

• Math for economists
  – Review and learn math concepts/methods
  – Apply to economic problems

• Pre-requisites
  – Econ 200, Econ 201, Math 220 or Math 140
  – If you took Math 141 and liked it, may want to take Math 241 instead

Sample problem: Solve for x and y

\[ x + 2y = 3 \]
\[ x + y = 2 \]
Instructor

• Professor Cramton
  – www.cramton.umd.edu
  – Tydings 4101a, pcramton@gmail.com
  – Office hours by appointment
About Me

• B.S. Engineering, Cornell University
• Ph.D. Business & Economics, Stanford University
• Associate Professor, Yale University, 1984-93
• National Fellow, Hoover Institution, Stanford University, 1992-93
• Professor of Economics, University of Maryland, since 1993
• Chairman, Market Design Inc., since 1995
Teaching assistants

- **Hector Lopez**
  Tydings 4101D, Office hours Tue 2:30-3:30, Fri 12-1:00
  section 2 Fri 9am Tydings 2102
  section 3 Fri 10am Tydings 2102
  section 5 Fri 11am Tydings 2110

- **Yiqun Chen**
  Tydings 4128, Office hours Wed 2:30-3:30, Fri 11-12
  section 1 Fri 9am Tydings 1114
  section 4 Fri 10am Tydings 1132
  section 6 Fri 12pm Tydings 1108
Web sites

• cramton.umd.edu (click Courses, Econ 300)
  – Syllabus
  – Course documents
• elms.umd.edu
  – Grades
  – Announcements
• Email
  – Be sure your email at www.registrar.umd.edu is up to date
Software

- Make use of [www.wolframalpha.com](http://www.wolframalpha.com)
- Consider [Wolfram Alpha Pro](https://www.wolframalpha.com/pricing.html), $2.99/month
- For most advanced use consider Mathematica 9, free download [www.oit.umd.edu/slic/howto/homeuse.html](http://www.oit.umd.edu/slic/howto/homeuse.html)
- Demonstrations illustrate topics in course
- You may use Wolfram Alpha and Mathematica for problem sets (but not exams)
Problem sets

• 6 problem sets
• Hard copy handed in at discussion session
• Hand in to Econ 300 mailbox if must miss session, not my mailbox
• *No late problem sets accepted for any reason*
• Grade: 4 excellent, 3 good, 2 fair, 1 poor
  – Lowest score is dropped
Recommended Textbook (Klein)

- Michael W. Klein, *Methods and Tools of Economic Analysis* (Custom Edition for University of Maryland Econ 300), Pearson
- Or: Michael W. Klein, *Mathematical Methods for Economics* Addison-Wesley
- We won’t use bundled software.
Grades and assignments

- Problem sets 10%
- First midterm exam 25%
- Second midterm exam 25%
- Final exam 40%
- Total 100%
Exams

• Multiple choice
• Can bring
  – 8.5 x 11, Cheat sheet (two-sided)
    Formulas, definitions, theorems, steps, etc.
  – Calculator with log, e^x, x^y, +, −, ×, /
• Cannot bring
  – Computer, iPhone, …
  – Books
Topics

- Functions
- Exponential functions
- Logarithmic functions
- Systems of equations
- Differential calculus
- Univariate calculus
- Elasticities
- Multivariate calculus
- Extreme values
- Constrained optimization
- Statistics and probability
- Decision making under uncertainty
- Risk theory
- Game theory
- Market games
Why math in economics?

• Because it is useful
• Economics - study of choice and decision-making in a world with limited resources
• Mathematics - logic of quantity and shape and arrangement
Both built on a few assumptions

- People have preferences and seek to maximize happiness
  - Consumers maximize utility
  - Firms maximize profits

- Use math to model economic setting
  - Improve our understanding of economic world
  - Make a better world
Learn how to do math in economics

• Conrad Wolfram at TEDGlobal 2010, “Stop Teaching Calculating, Start Teaching Math”
  www.computerbasedmath.org