MATH 1119B: Week 1, Lecture 1

David Thomson

Carleton University

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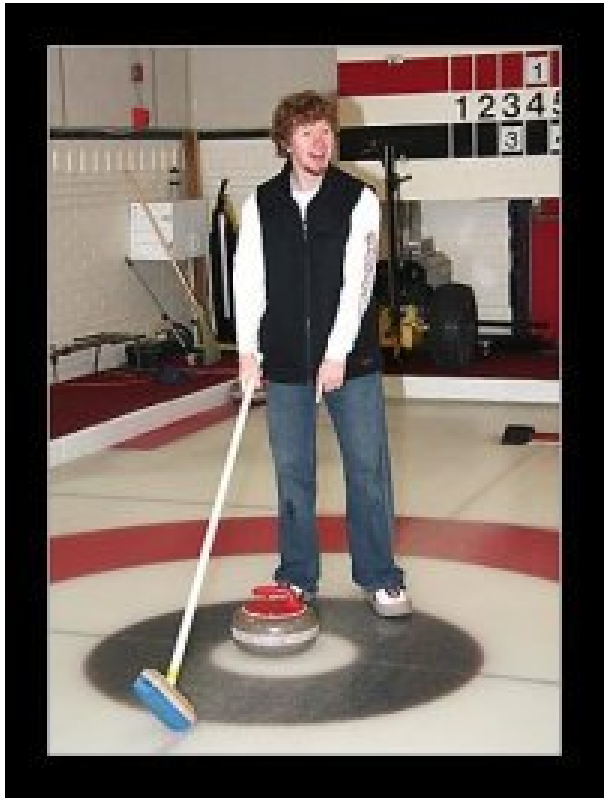
Table of Contents

Welcome

Welcome to MATH 1119B!

This guy is your instructor.



Be afraid. (Really, don't.)

Tutorials

- Tutorials begin Monday September 19 at 09:35.
- Worth 5% of the final grade.
- You will work on problems in groups of up to 4.
- Submit one copy of a sample problem (chosen by me) as a group. The problem will be announced approximately 20 minutes before the end of class by your TA.

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- Your TAs are there to help.
- Tutorials are where you REALLY learn to do the math.

Syllabus

Stuff on the interwebs

- The primary webpage for this course is on my webpage `http://www.math.carleton.ca/~dthomson/`.

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- The primary webpage for this course is on my webpage `http://www.math.carleton.ca/~dthomson/`.
- WebCT will be used to store grades, as well as the occasional announcement.
- The best way to contact me is through my email `dthomson@math.carleton.ca`.
- If you don't use your @connect email address, I may delete the mail as spam (or the email server may automatically).

Course conflicts

- Two students are registered in both this course AND BUSI 1800 at the same time. If this is you, please come see me. I highly recommend not registering in a conflict.

Course conflicts

- Two students are registered in both this course AND BUSI 1800 at the same time. If this is you, please come see me. I highly recommend not registering in a conflict.
- One student is registered in B. Eng. Double-check that you shouldn't be in MATH 1104. The content is similar, but the Professional Engineers society will not be happy with you.

SP-AS Crypto School

Image in public domain, courtesy of Wikipedia.

- I will be away Wednesday October 19 and Monday October 24.
- There is no test on Monday October 24.
- There WILL be class on both of these days. Lecture notes will be prepared by me, and given by another instructor authorized by both myself and the Director of the School.

An equation

Consider the equation

$$3x + 2y = 4.$$

What information do we get from this?

- It is the equation of a line.

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- Draw the line.

Two equations

Consider the two equations

$$3x + 2y = 4 \tag{1}$$
$$-2x + y = 2. \tag{2}$$

- Both are lines.
- Line (1) is the same as the previous slide.
- Line (2) has slope

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Do the lines intersect? How do we know?
(Hint!!) It's a trick question.

Two more equations

Two more equations:

$$3x + 2y = 4 \tag{3}$$

$$y = -\frac{3}{2}x \tag{4}$$

Do the lines intersect? How do we know?

What is linear algebra?

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- Many problems can be expressed in terms of systems of linear equations (of any number of variables).

- What makes an equation linear?

All exponents on variables are 1.

e.g.,

$$3x^1 + 2y^1 = 4$$

Solving systems of equations

What is a solution of a system of equations?

Ans.: Entries for the variables that simultaneously satisfy every equation in the system.

How do we solve systems of equations?

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- Substitution.
- Elimination.

Solve a system by substitution

Remember the system of equations:

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Use substitution to solve the system of equations.

Ans.:

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Ans.: $x = 0$, $y = 2$ (sound familiar?).

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Now, remember this system:

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Solving gives:

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$$0 = 4$$

What does this mean?

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Consider the system of equations:

$$x + 3y = 2$$
$$3x + 9y = 6$$

Use elimination to solve the system of equations.
The answer is:

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This means that the equations are, in some sense, equivalent. In fact, we showed that the second equation is 3 times the first equation.

Here, this means that the two lines are equal. What is the solution set of the system??

Types of solutions to linear equations

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1. Unique solution (consistent)

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Excited?