# Welcome to Algebra MA 183 - First Year Honours

**Lecturer**: Dr Rachel Quinlan

Office : Room 105 (Ground Floor), Áras de Brún

e-mail: rachel.quinlan@nuigalway.ie

Phone : 091 493796

**Lecture Times** : Tuesday 10.00, Wednesday 10.00, Kirwan Lecture Theatre.

**Continuous Assessment**: Homework Assignments

In-class midterm assessment in week starting October 22

Participation in weekly workshop

Winter Test in final week of Semester 1 (for Science students)

**Electronic Resources**: Will be posted on the MA180 Blackboard page.

Go to `http://blackboard.nuigalway.ie` and log in using your usual NUI Galway username and passworf. If you have completed your registration you should be automatically enrolled in the Blackboard course *MA180 First Year Honours Mathematics*.

**Supplementary Reading**: Suitable books to look at are

- *Introductory Mathematics : Algebra and Analysis* by Geoff Smith (510 SMI)
- *Discrete Mathematics* by Norman Biggs (510 BIG)

# MA180 Weekly Workshops

- Every student registered in MA180 will attend a one-hour workshop each week. The workshop will focus on *mathematical skills* rather than on specific knowledge, and will give students an opportunity to become involved in different aspects of mathematical thinking.
- The workshop will begin next week (September 24).
- Participation in the workshop is compulsory and attendance will be taken.
- Please indicate your availability for workshop times by filling out the form that is being circulated.
- In addition to the workshops, students will have the opportunity to attend tutorials at which problems related to the assigned homework will be discussed. These will begin in a few weeks - more details later.

## What I expect from students in MA183

1. I expect you to engage in *hard thinking* about mathematical ideas (more on that later).
2. Attend lectures and workshops (and don't disturb other students while doing so!)
3. Do not leave lectures early (unless in emergency).
4. Independently study the lecture notes and other course materials - take control!
5. Make use of the materials on the Blackboard page.
6. Spend time working on the homework problems.
7. Hand in your solutions to the homework assignments on time, having done your best to write up your solutions in a presentable and legible manner.
8. Let me know if you have any difficulties with the course.

## What you can expect from me

I will :

1. Attend lectures, and try to present the material in a coherent manner.
2. Distribute homework problems throughout the term.
3. Update the algebra materials on the Blackboard page regularly. These will include
   - Lecture notes
   - Homework problems, followed later by solutions
   - Announcements from time to time.
4. Respond as promptly as possible to queries made by phone, e-mail or in person and be available for consultation.
5. Be receptive to feedback.

# What is Mathematics?

- A science (or group of related sciences) dealing with the logic of quantity and shape and arrangement ??

*http://wordnet.princeton.edu/perl/webwn*

- The science of numbers and their operations, interrelations, combinations, generalizations, and abstractions and of space configurations and their structure, measurement, transformations and generalizations. ???!

*Merriam-Webster online dictionary*

- The abstract science of number, quantity and space studied in its own right (pure mathematics) or as applied to other disciplines such as physics, engineering etc (applied mathematics) ??

*Oxford Concise English Dictionary*

- Another definition proposed by mathematicians :

*"The theory of formal structures"*

# What is Algebra?

The word *algebra* comes from the Arabic term *al-jabr* which appears in the title of a treatise on quadratic equations and expressions by Al-Khwarizmi who lived in Baghdad in the ninth century.

Algebra is sometimes considered to be concerned with the manipulation of mathematical expressions and the solving of equations such as (systems of) linear equations or polynomial equations. This is a narrow interpretation at best, although some aspects of modern algebra arose from efforts to understand equations of certain types.

Modern algebra is the abstract study of algebraic structures including number systems, which are naturally equipped with operations such as addition and multiplication. Since the late 19th century algebra has been strongly influenced by the axiomatic movement in mathematics : different types of algebraic structures are defined according to systems of axioms or rules, and people study the consequences of these axioms and variants of them.