TMA 4115 Matematikk 3

Introduction for MBIOT5, MTKJ, MTNANO

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07. January 2014

Homepage

General information for the course Matematikk 3:

`https://wiki.math.ntnu.no/tma4115/2014v`

Specific information for MBIOT5, MTKJ, MTNANO:

`https://wiki.math.ntnu.no/tma4115/2014v/as`

(all slides used in the lecture will appear on this page)

At the end of the course there will be a written exam (further information on the homepage).

To take the exam:
Deliver **at least 8** excercise sets, which get approved.

Advice: Do as many excercises as possible!

Lecturer

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Reference groups – Important!

We need 4-5 students for the reference group of this course.

At least 1 student from MBIOT5, MTKJ and MTNANO.

If you are interested please sign the list in the break.

Topics of this course

- Complex Numbers
- Differential Equations I: Second Order Differential Equations
- Differential Equations II: Systems of differential equations
- Linear Algebra and Application
  - Matrices
  - Systems of linear equations
  - Vector spaces

We know the following sets of numbers:

$\mathbb{N}$	$= \{ 1, 2, 3, 4, \dots \}$	Natural numbers
$\mathbb{Z}$	$= \{ \dots, -3, -2, -1, 0, 1, 2, 3, 4, \dots \}$	Integers
$\mathbb{Q}$	$= \{ \frac{m}{n} \mid m \in \mathbb{Z}, n \in \mathbb{N} \}$	Rational numbers
$\mathbb{R}$	$=$ Rational numbers and irrational numbers (e.g. $\sqrt{2}, \pi, \dots$)	Real Numbers

Problem:

With all these numbers, we still can not solve the equation

$$x^2 = -1$$

since for real numbers $x^2 \geq 0$.

Solution: We need new numbers: The *complex numbers*.

Complex does not mean complicated!