2014–15 **MAT233 Matematik III – Bilgi** N. Course

Welcome to *Matematik III* aka *Calculus III*.

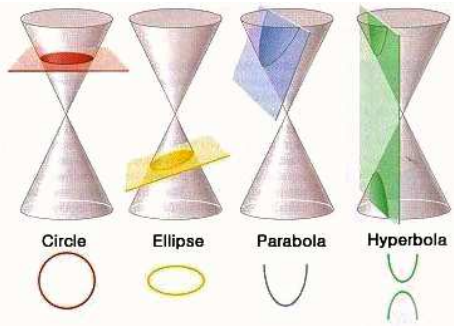
Course Website

`x.co/mat233`

Kitap/Suggested Text(s)

- George Thomas et al, *Thomas' Calculus*, 11th or 12th edition, Pearson. (This book is available in both English and Turkish editions. I suggest that you look at the English edition, because your exams will be in English.)

Giriş/Introduction



If we cut a double cone with a horizontal plane, we get a circle. As you learned last year, the equation for a circle of radius a, with centre at (h, k) is

$$(x-h)^2 + (y-k)^2 = a^2.$$

If we cut with a double cone with a plane, we might get an ellipse, a parabola or a hyperbola instead. These four shapes are called *conic sections*.

We will spend the first few weeks studying conic sections.

Later we will study functions of several variables, e.g.

$$f : \mathbb{R}^3 \to \mathbb{R}, \qquad f(x, y, z) = \sqrt{x^2 + y^2 + z^2}$$

and

$$g : \mathbb{R}^2 \to \mathbb{R}, \qquad g(x, y) = x \sin y.$$

When we differentiate a function like these, we have to use partial derivatives. For example,

$$\frac{\partial g}{\partial x}(x, y) = \sin y \qquad \text{and} \qquad \frac{\partial g}{\partial y}(x, y) = x \cos y.$$

Notice that we write $\frac{\partial g}{\partial x}$ instead of $\frac{dg}{dx}$.

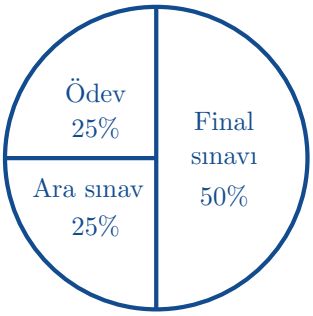
In the final section of the course, we will study multiple integrals: You will learn how to calculate

$$\int_0^2 \int_1^2 (4 - x - y)\, dy\, dx = 3$$

for example.

Içerik/Contents

"The only way to learn mathematics is to do mathematics." – Paul Halmos (1916–2006)



During the course, there will be homework problems for you to study. While you can, of course, study the homework problems in groups; I expect you to write your final version on your own. Plagiarism is not acceptable: **If you copy another student's homework, or if you allow someone to copy your homework, then you will both receive a mark of zero!** *İntihal bir suçtur: Başka bir öğrencinin ödevinden kopya çekerseniz, ya da sizin ödevinizden kopya çekmesine izin verirseniz, her ikiniz de sıfır alacaksınız!*

There will be only one mid-term exam.

For a course with 4 hours of lectures per week; I expect you to spend atleast 4 hours every week, studying outside of class. At a minimum, you should be reading the textbook, and attempting the exercise questions in there (not just the ones I set for homework).

If you miss a lecture; I expect you to copy your friends' notes or read the textbook, to catch up.

Not/Grades

I will give a pass (grade DD) for a mark of 40/100 or higher, grade DC for ≥ 46, grade CC for ≥ 52, grade CB for ≥ 58, grade BB for ≥ 64, grade BA for ≥ 70, and grade AA for ≥ 76.

Dersler/Lectures

- Çarşamba 9:00–11:00, oda D303
- Perşembe 9:00–11:00, oda D405

Ofis Saati/Office Hours

If you have any questions, or would like any extra hints for the homework, you can find me in my office at the following time:

- Perşembe 12:00–13:00;

Alternately, you can email your questions to me at `neil.course@okan.edu.tr`

Ders programı/Syllabus

- Conic Sections, Eccentricity,
- Polar Coordinates, Drawing Graphs in Polar Coordinates,
- Functions of Several Variables, Limits and Continuity,
- Partial Derivatives, Directional Derivatives,
- Extreme Values and Saddle Points, Lagrange Multipliers,
- Double Integrals, Triple Integrals, Integrals in Polar Coordinates, Substitutions in Multiple Integrals