

Math 1B03 Midterm 1 Info Sheet

The purpose of this handout is to help you study by listing the concepts, definitions, and results you will need to know for the midterm.

Midterm Information. The midterm will be on Wednesday Oct 2, 2019 at 7:00PM. The midterm will be 75 minutes long. Note that we will be spread across 5 different classrooms. Please see below for your room assignment (you can also find this information via the homework portal). You will *not* be allowed to bring in any notes, use the text book, or use a calculator.

Please bring your **STUDENT CARD**. The midterm will consist of 16 multiple choice questions and 2 short answer questions.

In case of conflicts. It is expected that you attend the scheduled midterm. Students who have legitimate conflicts (e.g., an evening class at the scheduled time) there are two alternate times:

Wednesday, Oct. 2, 2019 at 2:30PM in KTH B132

Wednesday, Oct. 2, 2019 at 5:30PM in BSB 106

Please submit your request to write at an earlier date through the assignment portal. (There is an option on the main page entitled *Request an Alternate Write*.)

Material Covered. This midterm will focus only on the material of Sections 1.1–1.7 that was discussed in class and the homework. Below, I have given a breakdown of what you will need to know from each section. Note that when you are learning terms, it is good to think of an example that satisfies that term, and one that does not satisfy that term.

(Section 1.1) Know what a linear equation is, and what a system of linear equations is. Know the elementary row operations, and know what an augmented matrix is. You should know how many solutions a system of linear equations can have, and you should be able to describe the solution set of a system of linear equations. Also know the terms consistent and inconsistent.

(Section 1.2) Know the difference between the terms reduced row echelon form and row echelon form. Know the difference between free variables and leading variables. Know how to use the elimination procedures of this sections to find a solution to a system of linear equations, and how to use this procedure to turn a matrix into a (reduced) row echelon form. Know how to use the reduced row echelon form of the matrix to determine if a solution has zero, one, or an infinite number of solutions.

(Section 1.3) Know what a matrix is, what we mean by a column vector or row vector, a square-matrix, and the main diagonal. Know how to add and subtract matrices, how to do scalar multiplication, and how to multiply two matrices together. Know how to express a system of linear equations as a matrix equation (see page 34). Know what the transpose of the matrix is. Also know what the trace of a matrix is.

(Section 1.4) You should know all the arithmetic properties of matrices (Theorem 1.4.1). Know what it means for two matrices to commute. Know what the zero matrix and identity matrix are, and know their properties. Make sure you know which properties matrices fail (see examples 2,3 and 4). Know what it means for a matrix to be invertible, and know the formula for finding the inverse of a 2×2 matrix (see Theorem 1.4.5). Know the properties of matrices described in Theorem 1.4.6, 1.4.7,1.4.8, and 1.4.9.

(Section 1.5) Know what an elementary matrix is. Know how each row operation can be identified with an elementary matrix. Know the statement of Theorem 1.5.3. Know how to use row operations to find the inverse of a matrix (see Example 4).

(Section 1.6) Know the statement of Theorem 1.6.1. Know how to use Theorem 1.6.2 to solve a system of linear equations. Know Theorem 1.6.4 (you don't need to know the proof, but you need to know which statements are equivalent). Know how to determine if a system $A\mathbf{x} = \mathbf{b}$ is consistent (see Example 3).

(Section 1.7) Know what we mean by a diagonal, triangular, and symmetric matrix. Know the properties of symmetric matrices described in Theorems 1.7.2, 1.7.3, and 1.7.4.

(Matlab) There will also be a question relating to the syntax of Matlab.

If you have questions, please feel free to email your instructor. A midterm review session is also planned through the Math Help Centre. Good luck!

Room Assignment. The midterm will be spread across the following 5 rooms. Please go to the room indicated by your last name. As a suggestion, go visit your test room some time before the midterm.

Last Name (between the following letters)	Room
A – GOUPIL	ABB 102
GRALA – HIRJAK	KTH B104
HO – LIU	KTH B135
LO - U	MCMST CDN_MARTYRS
V – Z	MDCL 1105

Here is the KEY for the above abbreviations:

ABB = A.N. Bourns Science Building

KTH = Kenneth Taylor Hall

CDN_MARTYRS = Canadian Martyrs Testing Centre

MDCL = Michael G. DeGroote Centre for Learning and Discovery