

MATH 206
Algebra & Functions
Summer 2021

- Instructor:** Mr. R. Klimov
Email: roman.klimov@concordia.ca
- Preface:** Due to exceptional circumstances, this course will be taught, and all assessments will be done completely ONLINE. There will be video lectures via Zoom during the scheduled course hours. Given the subject matter and nature of this course, **the midterm and the final exams will be given online through MyLabMath.**
- Textbook:** *College Algebra*, 10th Edition, by Michael Sullivan, Pearson Education, Inc.
The digital version of the textbook will be available at:
<https://www.co-opbookstore.ca/service/textbooks/>
The print version of the textbook will be available at:
<https://www.bkstr.com/concordiastore/home>
Note: Students should order textbooks as early as possible, especially for printed versions in case books are backordered or there are any shipping delays.
- Note:** This course is recommended to Psychology students as preparation for their statistics courses. Math 200 or some previous exposure to Algebra is assumed in this course. For this reason, a placement test to help you determine if you are ready for Math 206 is included at the end of this outline. Please take it seriously and consult your instructor or an academic advisor if in doubt.
- Office Hours:** Your professor will announce her/his office hours during which she/he will be also available to give a reasonable amount of help. The office hours will be held over Zoom and one can also send questions via email. Note that the system does not allow one to reply to an email sent from Moodle. Thus, emails should be sent from one's own emailer, not Moodle. Note, however, that if you missed a class it is not reasonable to expect your professor to cover the missed material for you.
- Tutorials:** The material in this course requires a lot of practice. The Department has therefore organized special ONLINE tutorial sessions conducted every week to provide additional support to students outside the online lecture environment. These sessions are conducted by tutors who will help with solving problems on the topics learned in class that week, with particular emphasis on the material that students may have difficulties within this course. Students are strongly encouraged to participate and be active at these problem-solving classes. Tutorials are an important resource to help students succeed in this course.

Math Help Centre: A Math Help Centre staffed by graduate students is available. The schedule of its operation will be posted on the Department webpage <https://www.concordia.ca/artsci/math-stats/services/math-help-centre.html>.

MyLabMath: Every student who buys an electronic version of the textbook will also receive an access code to an online system called **MyLabMath**. Once they have registered for **MyLabMath**, student can download the Pearson e-text 2.0 app so that they can access the textbook from their phone or tablet. The system provides you with a full electronic version of the text (an eBook) as well as many exercises and practice problems. Students will use this system to do online assignments (see **Assignments** below). Students are also strongly encouraged to use this resource to help with problems similar to assignment problems, and in areas where they need extra assistance. If you have an old **MyLabMath** account, please refer to the footnote* on page 2.

Assignments: Students are expected to submit assignments online using **MyLabMath**. Late assignments **will not** be accepted. Assignments contribute 10% to your final grade. Working regularly on the assignments is essential for success in this course. Students are also strongly encouraged to do as many problems as their time permits from the list of supplementary problems included in this outline.

Calculators: Only calculators approved by the Department such as **Sharp EL 531** or the **Casio FX 300MS**, are permitted for the class test and final examination. See <http://www.concordia.ca/artsci/math-stats/services.html> #calculators for details.

Midterm Test: There will be one **midterm test**, based on the material of lectures 1-7, which will contribute up to 25% to your final grade (see the **Grading Scheme** below). Missed tests cannot be made up. **Midterm test will be held during online lecture time (via MyLabMath).**

NOTE: It is the Department's policy that tests missed for any reason, **including illness**, cannot be made up. If you miss the midterm test **because of illness (medical note required)** the final exam will count for 90% of your final grade, and the assignments will count for the remaining 10%.

Final Exam: **The final examination will be given online (via MyLabMath).** This exam will be two hours long and will cover all the material in the course.

NOTE: Students are responsible for finding out the date and time of the final exams once the schedule is posted by the Examinations Office. Conflicts or problems with the scheduling of the final exam must be reported directly to **the Examinations Office, not to your instructor**. It is the Department's policy and the Examination Office's policy that students must be available to take the final exam on the selected date and time. Conflicts due to travel plans will not be accommodated.

*If you are repeating this course and have an old **MyLabMath** account, you might be able to get your account extended. To request this, please contact our Pearson representative at Christine.Cozens@PearsonEd.com and provide the following information:

- Your full name and Concordia student ID number.
- The name of the course, section, and the term you are currently registered in (e.g. MATH 206/Section AA – Summer 2021).

Grading Scheme: The final grade will be based on the higher of (a) or (b) below:

- a) 10% for the assignments,
25% for the midterm test,
65% for the final exam.
- b) 10% for the assignments,
15% for the midterm test,
75% for the final exam.

IMPORTANT: PLEASE NOTE THAT THERE IS NO “100% FINAL EXAM” OPTION IN THIS COURSE.

Lectures	Sections	Supplementary Problems
1	R4 Polynomials R5 Factoring Polynomials R6 Synthetic Division R7 Algebraic Expressions	27, 33, 37, 49, 57, 61, 71, 73, 75, 87, 95, 99 17, 19, 27, 29, 35, 41, 49, 53, 71, 75, 83, 91, 95 5, 9, 19, 23 7, 9, 13, 19, 27, 39, 49, 65, 69
2	R8 n^{th} Roots, Rational Exponents 1.1 Linear Equations 1.2 Quadratic Equations 1.4 Radical Equations, Equation Quadratic in Form; Factorable Equations	9, 15, 18, 29, 31, 45, 48, 49, 59, 69 17, 19, 25, 29, 37, 41, 47, 77, 81 9, 17, 33, 36, 37, 42, 43, 49, 55, 65, 79, 89 8, 11, 17, 21, 33, 41, 45, 49, 55, 65, 73, 77
3	1.5 Solving Inequalities 1.6 Equations and Inequalities involving Absolute Value 1.7 Problem Solving	55, 57, 61, 63, 69, 81, 99 7, 11, 25, 29, 35, 37, 41, 47 23, 25, 31, 34, 35, 45
4	2.1 Distance and Midpoint 2.2 Graphs of Equations, Intercepts, Symmetry 2.3 Lines 2.4 Circles	21, 24, 31, 37, 40, 57 17, 23, 25, 41, 43, 45, 51, 53, 56, 61, 64 15, 21, 25, 39, 41, 49, 52, 62, 72, 78 14, 17, 22, 25, 29, 35, 39
5	3.1 Functions 3.2 Graphs of Function	27, 29, 31, 37, 47, 54, 57, 63, 70, 87, 89, 93 14, 23, 27, 35
6	3.3 Even and Odd Functions 3.4 Library of Functions 3.5 Graphing Techniques, Transformations 3.6 Mathematical Models	33, 34, 39, 41, 42 18, 19, 21, 23 19, 21, 23, 25, 29, 53, 59 5, 10, 13, 23
7	4.1 Linear Functions 4.3 Quadratic Functions 4.4 Quadratic Models 4.5 Inequalities involving Quadratic Functions	29, 31, 39, 49 19, 21, 37, 41, 44 8, 9, 14, 17 3, 6, 7, 11, 15, 21, 25
8	5.1 Polynomial Functions 5.2 Properties of Rational Functions 5.3 Graph of Rational Function 5.4 Polynomial and Rational Inequalities	17, 19, 21, 25, 27 11, 14, 21, 27, 29, 37, 42, 44, 47 7, 10, 17, 20 3, 6, 8, 13, 18, 22, 24, 26, 31
9	6.1 Composite Functions 6.2 One-to-One and Inverse Functions	14, 15, 17, 23, 25, 31, 39 33, 35, 50, 51, 59, 61, 65, 75, 90

10	6.3	Exponential Functions	13, 17, 19, 38, 41, 51, 53, 60, 62, 64, 66, 75, 77 10, 13, 19, 23, 27, 29, 31, 37, 43, 46, 77, 82, 91, 93, 97, 101, 103, 111, 119, 133 7, 10, 14, 15, 19, 31, 33, 36, 39, 41, 53, 55, 62, 81, 83, 87
	6.4	Logarithmic Functions	
	6.5	Properties of Logarithms	
11	6.6	Logarithmic and Exponential Equations	6, 8, 25, 27, 33, 37, 42, 47, 51, 55 5, 7, 13, 16, 21, 25, 32, 36, 39, 41, 46, 50 2, 4, 7, 9, 11
	6.7	Compound Interest	
	6.8	Exponential Growth and Decay Models	
12	8.1	Systems of Linear Equations	17, 20, 21, 23, 26, 30, 32, 37, 55, 58, 62 5, 9, 16, 26, 34, 41, 46, 71, 73, 87
	8.6	Systems of Non-Linear Equations	
13	Review		

Academic Integrity and the Academic Code of Conduct

This course is governed by Concordia University's policies on Academic Integrity and the Academic Code of Conduct as set forth in the Undergraduate Calendar and the Graduate Calendar. Students are expected to familiarize themselves with these policies and conduct themselves accordingly. "Concordia University has several resources available to students to better understand and uphold academic integrity. Concordia's website on academic integrity can be found at the following address, which also includes links to each Faculty and the School of Graduate Studies: concordia.ca/students/academic-integrity." [Undergraduate Calendar, Sec 17.10.2]

Note: Zoom is included as an institutionally approved technology. This means we have been assured of the privacy protections needed to use freely within the classroom.

Zoom will be used in this course to facilitate learning at a distance. It may be used to record some or all of the lecture and/or other activities in this course. If you wish to ensure that your image is not recorded, speak to your instructor as soon as possible.

Also, please note that you may not share recordings of your classes and that the instructor will only share class recordings for the purpose of course delivery and development. Any other sharing may be in violation of the law and applicable University policies, and may be subject to penalties.

Behaviour

All individuals participating in courses are expected to be professional and constructive throughout the course, including in their communications.

Concordia students are subject to the [Code of Rights and Responsibilities](#) which applies both when students are physically and virtually engaged in any University activity, including classes, seminars, meetings, etc. Students engaged in University activities must respect this Code when engaging with any members of the Concordia community, including faculty, staff, and students, whether such interactions are verbal or in writing, face to face or online/virtual. Failing to comply with the Code may result in charges and sanctions, as outlined in the Code.

Intellectual Property

Content belonging to instructors shared in online courses, including, but not limited to, online lectures, course notes, and video recordings of classes remain the intellectual property of the faculty member. It may not be distributed, published or broadcast, in whole or in part, without the express permission of the faculty member. Students are also forbidden to use their own means of recording any elements of an online class or lecture without express permission of the instructor. Any unauthorized sharing of course content may constitute a breach of the [Academic Code of Conduct](#) and/or the [Code of Rights and Responsibilities](#). As specified in the [Policy on Intellectual Property](#), the University does not claim any ownership of or interest in any student IP. All university members retain copyright over their work.

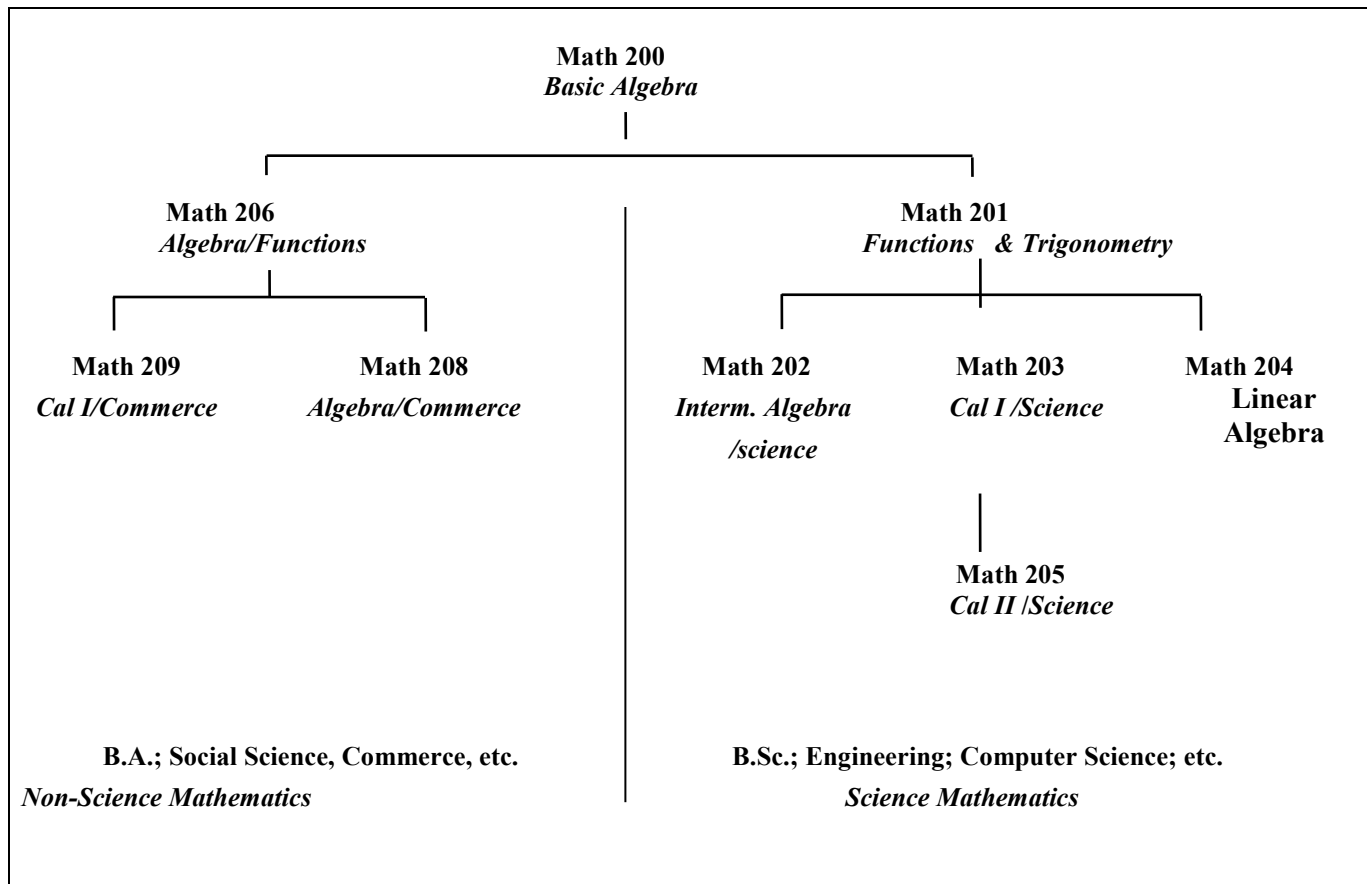
Extraordinary circumstances

In the event of extraordinary circumstances and pursuant to the [Academic Regulations](#) the University may modify the delivery, content, structure, forum, location and/or evaluation scheme. In the event of such extraordinary circumstances, students will be informed of the changes.

Choosing Between Math 200 and Math 206

If the last math course you took was at the high school level (Quebec), and more than five years have passed since, you should probably register for Math 200. If you are still unsure of your level, read on.

Math Courses at Concordia



A self-administered test to help you decide between Math 200 and Math 206, follows. Give yourself about 20 or 30 minutes to complete the test. Be honest with yourself, since registering in the wrong course may cost you money and result in a poor grade. Remember that all university level courses usually demand quite a bit of your time. Students in Math 206 will find they will not have time once the course begins to review material that they are expected to know before they enter the course.

Dropping a course: If you find yourself "out of your depth" and decide to drop the course, you must drop the course on your myconcordia portal at www.myconcordia.ca before the published deadline. *If you just stop going to class without formally discontinuing the course, you will receive an F grade for the course.*

MATH 206 Self-Test
(One Mark for each correct answer)

- Simplify (write as a single number)
- 1) $3^2 - 2^3$
- 2) $\frac{6 - 4(6 - 4)}{2}$
- Solve for x :
- 3) $\frac{3}{2x - 1} = \frac{7}{3x + 1}$

4) $3x + 10 = 4$

- Expand (multiply out):
- 5) $(a - b)^2$

- Factor:
- 6) $x^2 - 16$

7) $x^2 + 5x + 6$

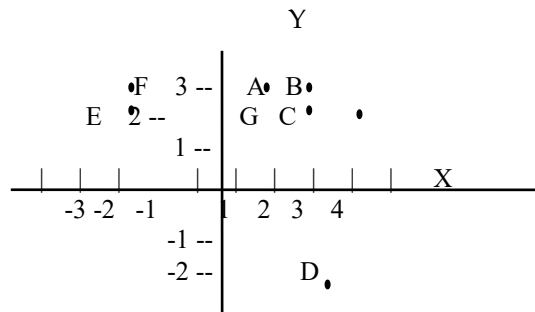
Substitute $a = 1, b = 1$, in the following equations in order to determine whether or not the statement is true or false:

8) $\frac{1}{a} + \frac{1}{b} = \frac{2}{a + b}$

9) $\sqrt{a + b} = \sqrt{a} + \sqrt{b}$

- Give the missing step or steps:
- 10) $\frac{a^2 + a}{a + 1} = ? = a$

- 11) Locate the points $(3, 2)$ and $(-2, 2)$ on the plane below:



- 12) Write an algebraic expression for: Twice x is equal to 3 less than half x .

Scoring: 6 or less = Math 200; 7-8 = see an advisor; 9 or better = Math 206.

Answers:

- 1) 1 2) -1 3) 2 4) -2 5) $a^2 - 2ab + b^2$ 6) $(x + 4)(x - 4)$ 7) $(x + 2)(x + 3)$ 8) False, $2 \neq 1$ 9) False, $\sqrt{2} \neq 2$ 10) $\frac{a(a+1)}{(a+1)} = a \frac{(a+1)}{(a+1)}$ 11) C is $(3, 2)$, E is $(-2, 2)$ 12) $2x = \frac{x}{2} - 3$