Department of Mathematics & Statistics
Concordia University

MATH 201
Elementary Functions
Winter 2024

Instructor: Ms. S. Karmani, Office: LB 916 (SGW), Phone: 848-2424, Ext. 3260/3223
Email: samaneh.samikermani@concordia.ca

Textbook: *Precalculus Essentials*, by J. Ratti and M. McWaters; Pearson Education. The e-text is included in the MyLabMath system the access card to which can be purchased at
https://pearsonhighered.onthehub.com/WebStore/OfferingDetails.aspx?o=6e3f781a-6a91-ea11-812b-000d3af41938

Office Hours: Your professor will announce her office hours during which she will be also available to give a reasonable amount of help. Note, however, that if you missed a class it is not reasonable to expect your professor to cover the missed material for you.

Tutorials: It takes a great deal of practice to succeed in this course. To complement lectures, the Department has organized weekly tutorials, which are conducted by tutors who will help with solving problems on the topics learned in class that week, with emphasis on the material that students may have particular difficulties within this course. Students are strongly encouraged to actively participate in these problem-solving sessions which can contribute very significantly to students' success in this course.

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

WeBWorK: Every student will be given access to an online system called **WeBWorK**. The system offers many exercises and practice problems. Students must use this system to do online assignments (see Assignments below). Before each exam (midterm and final), numerous practice problems will be posted on **WeBWorK** to aid students in their preparation.

MyLab Math: Every student who purchases the e-text will be given access to one more online system called **MyLab Math**. This system contains an e-version of the textbook, as well as a large number of various resources, like practice exercises, typical examples on different topics, often with solutions, video materials, etc., that help you master the course material.

Assignments: Students are expected to submit assignments online using **WeBWorK**. 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 recommended problems included in this outline, as well as work on the practice exercises in WeBWorK and in MyLab Math.

Calculators: Only calculators approved by the Department (with a sticker attached as proof of approval) are permitted for the class test and final examination. For a list of Approved and Not-approved calculators see www.concordia.ca/artsci/math-stats/services.html

Midterm Test: There will be **one midterm test**, based on the material of weeks 1-6 (as listed in the CONTENTS below), which will contribute up to 30% to your grade (see the **Grading Scheme**). The test will be common for all sections of the course and will be held on **Sunday March 10, 2024, at 17:30 (**i.e. **5:30 P.M.).**

Students who are unable to write the midterm test for a valid reason must inform their instructor in advance to request a 90% final exam option in calculating their grade (*see below*). Such a request **will not** be granted unless it is made in writing by email, and the reason is accepted as valid and supported by appropriate documentation or other evidence. **Valid reasons** for missing the midterm test include time conflicts (coinciding exam times) with other exams, religious observances (must be reported to the instructor ***in advance***); illness (to be reported as soon as possible and supported by a valid medical note). Students who miss the midterm test but were not approved for 90% final exam option as described above will not be granted it and will forfeit the marks for the midterm test.

N.B: Travel arrangements or participation in regular sports events are not considered a valid reason for missing the test.

NOTE: If you are taking another course with a common midterm test **at the same time** (NOT just the day) **as this one**, you may choose which of the two tests you want to write. You must then inform the instructor of the other (to be missed) course that you will not write that test because of the time conflict between the two courses, indicating clearly the second course and its section. In this case, the "90% final +10% assignments" scheme will be applied to calculate your grade.

Final Exam: The final examination will be three 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**.

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

a) 10% for the assignments, 30% for the midterm test, 60% for the final exam.
b) 10% for the assignments, 10% for the midterm test, 80% for the final exam.

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

CONTENTS

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]*

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.

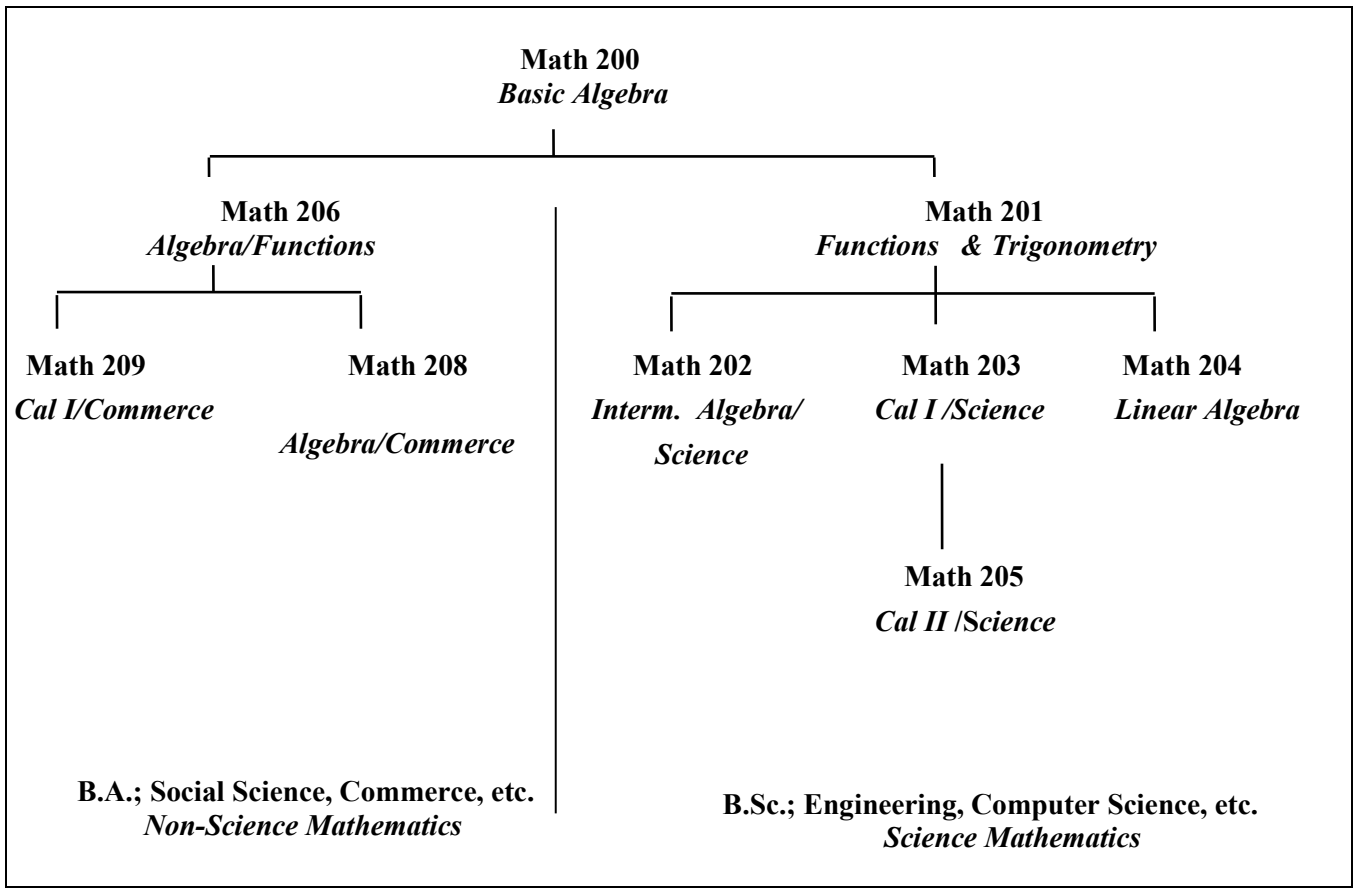
Extraordinary circumstances

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 change.

Choosing Between Math 200 and Math 201

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 201 follows. Give yourself about 30 minutes to complete the test. Be honest with yourself, since registering for 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 201 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.

Scoring: 15 or less = Math 200; 16-21 = see an advisor; 22 or better = Math 201.

MATH 201
Qualifying Test

Part One

1) The sum of $3x^2 + x - 7$ and $x^2 + 10$ can be expressed as

a) $4x^2 + x - 3$ b) $3x^2 + x + 3$ c) $4x^4 + x - 3$ d) $4x^2 + x + 3$

2) The product of $(-3xy^2)(5x^2y^3)$ is:

a) $-8x^3y^5$ b) $-15x^3y^5$ c) $-15x^2y^5$ d) $-15x^3y^6$

3) Expressed as a single fraction in lowest terms, the sum of $\frac{3x}{4}$ and $\frac{2x}{3}$ is equivalent to:

a) $\frac{5x}{7}$ b) $\frac{5x}{12}$ c) $\frac{17x}{7}$ d) $\frac{17x}{12}$

4) If $15x^6y$ is divided by $-3x^3$, the quotient is:

a) $-5x^2$ b) $-5x^3y$ c) $5x^2$ d) $5x^3y$

5) Written in factored form, the binomial $a^2b - ab^2$ is equivalent to:

a) $ab\,(a - b)$ b) $(a - b)\,(a + b)$ c) $a^2(b - b^2)$ d) $a^2b^2(b - a)$

6) The solution set for $2x^2 - 7x - 4 = 0$ is:

a) $\{2, 1\}$ b) $\{-\frac{1}{2}, 4\}$ c) $\{-2, 1\}$ d) $\{\frac{1}{2}, -4\}$

7) What is the solution for the following system of equations?
$2x + y = 7$
$x - 2y = 6$

a) $\{3, 1\}$ b) $\{1, 3\}$ c) $\{-1, 4\}$ d) $\{4, -1\}$

8) The sum of $\sqrt{12}$ and $5\sqrt{3}$ is:

a) $10\sqrt{3}$ b) $7\sqrt{6}$ c) $7\sqrt{3}$ d) 360

9) The graph of the line passing through the points (6, 7) and (4, 2) has a slope of:

a) $\frac{2}{5}$ b) $-\frac{5}{2}$ c) $\frac{5}{2}$ d) $-\frac{1}{2}$

10) The graph of the equation $y = 3$ is a line:

a) parallel to the x-axis
b) parallel to the y axis
c) passing through the points (6, 7)
d) passing through the point (3, 0)

11) Which equation represents a line whose slope is $\frac{1}{2}$ and whose y-intercept is 3?

a) $y=\frac{1}{2}x-3$ b) $y=-\frac{1}{2}x+3$ c) $y=3x+\frac{1}{2}$ d) $y=\frac{1}{2}x+3$

12) The inequality $3x + 2 > x + 8$ is equivalent to:

a) $x > -\frac{3}{2}$ b) $x > \frac{3}{2}$ c) $x > 3$ d) $x < 3$

13) The smallest whole number that satisfies the inequality $3x - 1 > 2$ is:

a) 1 b) 2 c) 3 d) 0

14) If x is an integer, what is the solution set of $3 < x \leq 6$?

a) {3, 4 , 5} b) {4, 5, 6} c) {3, 4, 5, 6} d) {4, 5}

15) The lengths of sides of a triangle are 8, 15, and 17. If the longest side of a similar triangle is 51, what is the length of the shortest side?

a) 32 b) 24 c) 16 d) 4

16. If two legs of a right triangle are 5 and 12, the hypotenuse is:

a) $\sqrt{119}$ b) $\sqrt{17}$ c) 17 d) 13

17) What is the circumference of a circle whose radius is 6?

a) 6π b) 12π c) 36π d) 3π

18) Maria is twice as old as Sue. If x represents Sue's age, which expression represents how old Maria will be in three years?

a) $2x$ b) $x + 3$ c) $\frac{1}{2}x - 3$ d) $2x + 3$

Part Two

1) Simplify: $(2w^3 - 5w - 15) - (-6w^2 + w - 15) + (4w^2 - 7)$

2) Evaluate: $-r - [-p - (-n + r)]$ for $n = -3$, $p = 4$ and $r = -1$

3) Simplify: $\dfrac{1}{3^{-1} - 4^{-1}}$

4) Perform the indicated operations: $-\dfrac{1}{6} + \dfrac{11}{14}$

5) Factor completely: $3x^2 - 15x - 42$

6) Perform the indicated operations and express in simplest form: $\dfrac{x^2 - 16}{x^2 - x - 20} \bullet \dfrac{1}{x - 4}$

7) Perform the indicated operations: $3\sqrt{96} + 6\sqrt{54} - 2\sqrt{150}$

8) Express $\dfrac{3}{\sqrt{5}+1}$ as an equivalent fraction with a rational denominator.

9) Solve: $-14 - 6a < -74$

10) Find a positive number whose square is 12 more than the number itself.

11) Solve $x + 5 = 3y - 2$
$2x + 7 = y + 3$

12) In a class of 24 students, 25% of them failed a test. How many students failed the test?

ANSWERS

Part One:
1. d); 2. b); 3. d): 4. b): 5. a); 6. b); 7. d); 8. c); 9. c); 10. a); 11. d); 12. c); 13. b); 14. b); 15. b): 16. d); 17. b); 18. d)

Part Two:
1. $2w^3 + 10w^2 - 6w - 15 - 7$; 2. 7; 3. 12; 4. $\dfrac{13}{21}$: 5. $3(x - 7)(x + 2)$; 6. $\dfrac{1}{x-5}$; 7. $20\sqrt{6}$; 8. $\dfrac{3\left(\sqrt{5}-1\right)}{4}$; 9. a > 10; 10. 4;
11. (–1;2); 12. 6.