Department of Mathematics & Statistics
Concordia University

MATH 201
Elementary Functions
Winter 2022

Instructor*: _____

Email: _____

Office Hours: _____

*Students should get the above information from their instructor during class time. The instructor is the person to contact should there be any questions about the course.

Textbook: *Algebra and Trigonometry*, by J. Abramson, OpenStax, 2015. This is a free online textbook.

Office Hours: Your professor will announce their office hours, during which they will be available to provide a reasonable amount of help. Note, however, that if you miss 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, wherein tutors will guide students through solutions to problems on topics covered in class the week prior. Emphasis will be placed on material with which students have difficulties. Students are strongly encouraged to actively participate in these problem-solving sessions.

Math Help Centre: Over and above tutorials, students may avail themselves of a Math Help Centre, which is staffed by graduate students. For a schedule, see 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.

Assignments: Students must submit assignments online using **WeBWorK**. Late assignments **will not** be accepted. Assignments constitute 10% of your final grade. Working regularly on 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 practice problems.

Midterm Test: There will be one 90-minute **midterm test,** based on the material of weeks 1-6, which will contribute up to 25% to your final grade (see the **Grading Scheme** below). The test will be **common** for all sections of this course and will be held on **Sunday March 13, 2022, at 1:00**

P.M. (13:00) **(Note that Daylight Saving Time begins on Sunday March 13.)** The location of the midterm test will be announced in a timely manner.

NOTE: It is the Department's policy that tests missed for any reason, including illness, cannot be made-up.

Students who are unable to write the midterm test for a valid reason must write to their instructor to request a 90% final exam. Such a request will not be granted unless it is made in writing (by email), the reason is valid, and is supported by documentation or other evidence. Valid reasons for missing a midterm test include: conflicts with other exams or religious observances (must be reported to the instructor in advance); illness (Short-Term Absence form or valid medical note required); bereavement. Students who miss the midterm test but do not request a 90% final, as described above, will not be granted a 90% final, and will forfeit the marks for the midterm test.

Travel arrangements are not considered a valid reason for missing the midterm test.

Final Exam: A three-hour cumulative final examination (covering all course content) will be given at a date, time and location to be determined by the Exams Office.

NOTE: Students are responsible for finding out the date and time of their final exam once the schedule is posted by the Exams Office. Conflicts or problems with the scheduling of the final exam must be reported directly to the Exams Office, not to the instructor.

Grading Scheme: Your final grade will be based on the highest of (a) and (b) below:
a) 10% for the assignments, 25% for the midterm test, 65% for the final exam.
b) 10% for the assignments, 10% for the midterm test, 80% for the final exam.

NOTE: If you miss the midterm test for a valid reason and make a written request, with supporting documentation/evidence, that is approved by your instructor, then your final grade will be based on: 10% for the assignments, 90% for the final exam.

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

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13	**REVIEW** of the course			

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]*

Use of Zoom
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 lectures 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 change.

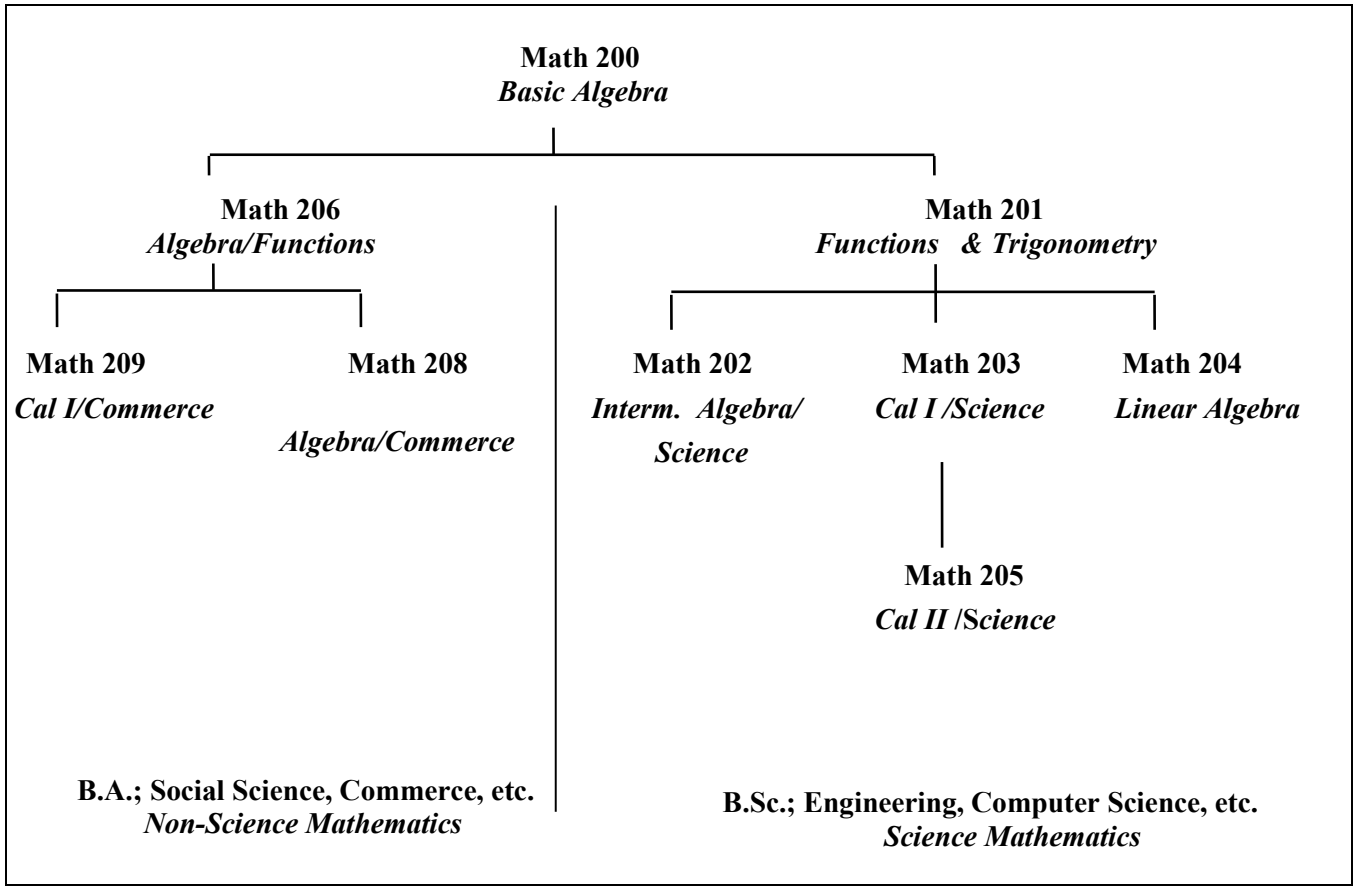
Territorial Acknowledgement. Concordia University is located on unceded Indigenous lands. The people of the Kanien'kehá:ka Nation are recognized as custodians of the lands and waters on which we gather. Tiohtià:ke/Montréal is historically known as a

gathering place for many First Nations. Today, it is home to a diverse population of Indigenous and other peoples. We respect the continued connections with the past, present and future in our ongoing relationships with Indigenous and other peoples within the Montréal community.

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 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 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.

Help: The Math Department runs a drop-in **Math Help Centre** in **LB 912** - call the Department's office for further information at 848-2424, Ext. 3222/3223.

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. $\dfrac{3(\sqrt{5}-1)}{4}$; 9. a > 10; 10. 4;
11. (–1;2); 12. 6.