

**MATH 201**  
Elementary Functions  
*Winter 2020*

Instructor\*: \_\_\_\_\_

Office/Tel No.: \_\_\_\_\_

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:** *Precalculus Essentials*, by J. Ratti and M. McWaters; Pearson Education.

**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. 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. There is not enough class time to do all the examples and problems needed to learn the material thoroughly. The Department has therefore organized special tutorial sessions conducted every week to provide additional support to students outside the lecture room 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 with in this course. Tutorials are an important resource to help you succeed in this course and students are strongly encouraged to participate and be active at these problem-solving sessions.

As an added incentive, several quizzes will be given during the tutorials, and up to five bonus marks will be added to your final mark from the quizzes.

**Math Help Centre:** In addition to Tutorials, 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 provides you with many exercises and practice problems. Students will use this system to do online assignments (see **Assignments** below). In addition, before the midterm test and a before the final exam, a number of practice problems will be posted in **WeBWorK** to help you review the material of the course.

**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 practice problems.

**Calculators:** Only calculators approved by the Department (with a sticker attached as a proof of approval), such as **Sharp EL 531** or **Casio FX 300MS**, available at the Concordia Bookstore, are permitted for the class test and final examination.  
For a list of Approved and Not-approved calculators see  
<https://www.concordia.ca/content/dam/artsci/math-stats/docs/AppCalculatorList.pdf>

**Midterm Test:** There will be one **midterm test**, based on the material of weeks 1-6, which will contribute up 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 8, 2020, at 14:00 (i.e. 2:00 P.M.)** **Note that the time changes that day.** It is the Department's policy that tests missed for any reason, including illness, cannot be made up. If you miss the midterm for any valid reason, e.g. illness, religious, etc., supported by appropriate documentation, the final exam will count for 90% of your final grade, and the assignments will count for the remaining 10%.

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

**NOTE:** If you are taking another MATH 200 level course with a common midterm test at the same time as this one, you may choose which of the two tests you want to write. You must then inform the instructor of the other course that you will not write that test because of the time conflict between the two courses. In this case, the 90%-10% formula will apply to that other course.

**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, 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.  
Up to 5 bonus marks will be added from the quizzes (see **Tutorials**).

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

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Week	Sections	Recommended Problems		
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	1.2	Lines	p. 74	# 3, 5, 17, 23,29, 31, 53, 55, 65
2	1.3	Functions	p. 90	# 11, 17, 25, 27, 33, 35, 63, 69
	1.4	A Library of Functions	p. 106	# 9, 17, 19, 29, 31, 47, 51, 57
	1.5	Transformations of Functions	p. 121	# 3, 5, 11, 19, 33, 51, 63, 67
3	1.6	Combining Functions, Composite Functions	p. 132	# 5, 9, 11, 29, 31, 43, 47, 49
	1.7	Inverse Functions	p. 144	# 13, 21, 23, 27, 37, 43, 45
4	2.1	Quadratic functions	p. 161	# 7, 9, 17, 21, 29, 45, 47, 61
	2.5	Rational Functions	p. 211	# 5, 19, 21, 25, 29, 33, 39, 51, 61
5	3.1	Exponential Functions	p. 235	# 5, 9, 13, 23, 31, 47, 51, 53
	3.2	Logarithmic Functions	p. 250	# 13, 23, 31, 37, 45, 53, 59, 93
6	3.3	Rules of Logarithms	p. 262	# 15, 23, 29, 35, 47, 51, 55, 71, 75
	3.4	Exponential and Logarithmic Equations	p. 273	# 5, 17, 21, 25, 29, 35, 47, 57, 59
7		<b>Pre-midterm Review</b> (time permitting)		
	4.1	Angles and Their Measure	p. 290	# 13,15,23,25,45,51,57,63,65,69
8	4.2	The Unit Circle, Trigonometric Functions	p. 307	# 3, 11, 27, 31,37, 57, 67, 75
	4.3	Graphs of the Sine and Cosine Functions	p. 325	# 13, 17, 23, 25, 33, 37, 41, 43
9	4.5	Inverse Trigonometric Functions	p. 348	# 9,15, 17,25, 35, 55, 59, 61, 71
	4.6	Right Triangle Trigonometry	p. 358	# 13, 17, 21,31, 35, 39, 41, 47, 53
10	4.7	Trigonometric Identity	p. 370	# 3, 15, 19, 27, 33, 41, 45, 71, 73
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11	5.1	The Law of Sine and the Law of Cosines	p. 407	# 1, 5, 7, 17,23, 27, 31, 49, 61, 65
12	5.2	Areas of Polygons and Trigonometry	p. 416	# 3, 5, 11, 13,23, 29, 33, 35
13	<b>REVIEW</b> of the course			

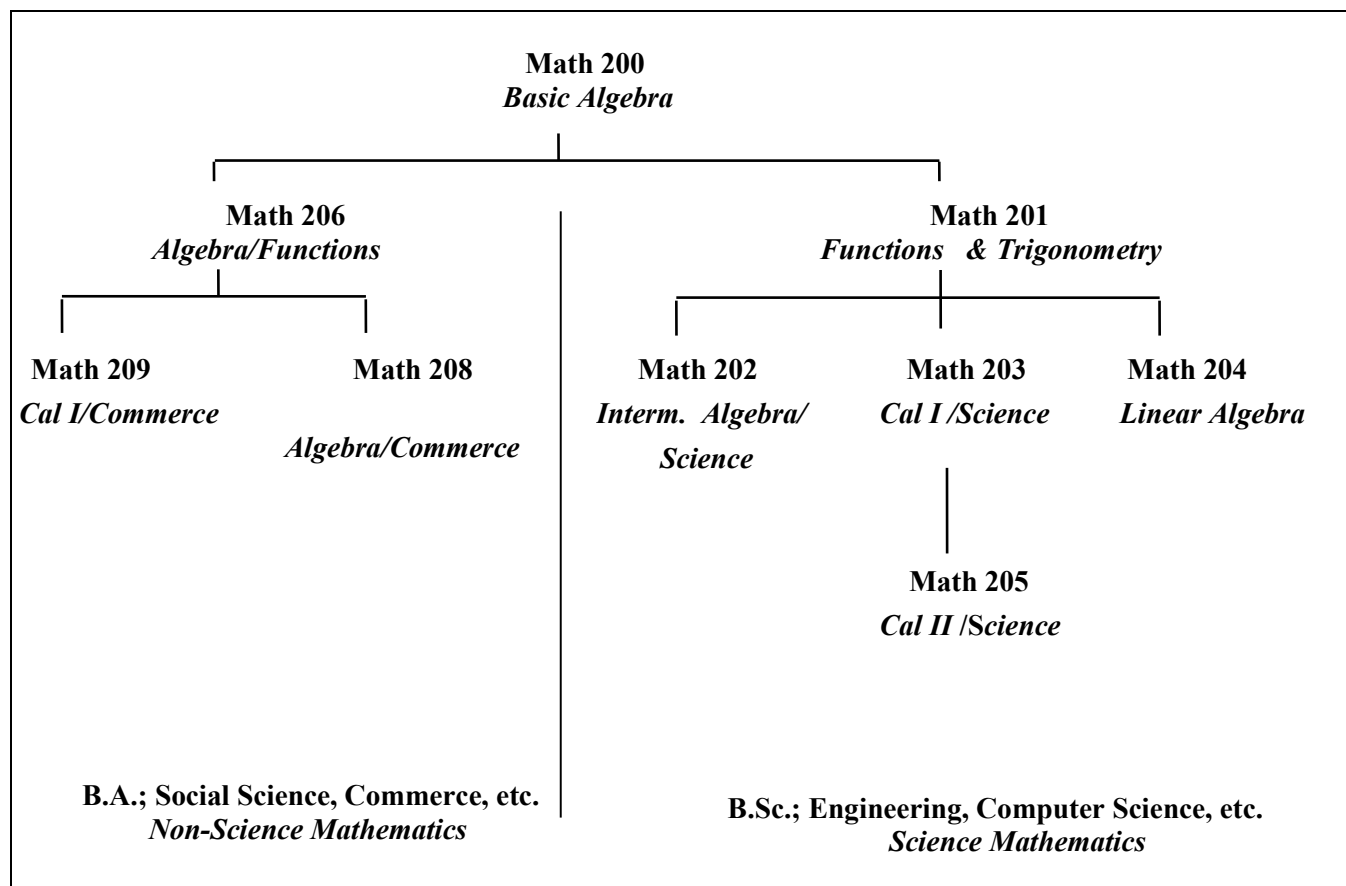
### Academic Integrity and the Academic Code of Conduct

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](http://concordia.ca/students/academic-integrity)." [Undergraduate Calendar, Sec 17.10.2]

### 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)  $6\pi$                       b)  $12\pi$                       c)  $36\pi$                       d)  $3\pi$

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:  $\frac{1}{3^{-1} - 4^{-1}}$
- 4) Perform the indicated operations:  $-\frac{1}{6} + \frac{11}{14}$
- 5) Factor completely:  $3x^2 - 15x - 42$
- 6) Perform the indicated operations and express in simplest form:  $\frac{x^2 - 16}{x^2 - x - 20} \cdot \frac{1}{x - 4}$
- 7) Perform the indicated operations:  $3\sqrt{96} + 6\sqrt{54} - 2\sqrt{150}$
- 8) Express  $\frac{3}{\sqrt{5} + 1}$  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 
$$\begin{aligned} x + 5 &= 3y - 2 \\ 2x + 7 &= y + 3 \end{aligned}$$
- 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.  $\frac{13}{21}$ ; 5.  $3(x - 7)(x + 2)$ ; 6.  $\frac{1}{x - 5}$ ; 7.  $20\sqrt{6}$ ; 8.  $\frac{3(\sqrt{5} - 1)}{4}$ ; 9.  $a > 10$ ; 10. 4;  
11.  $(-1; 2)$ ; 12. 6.