Mathematics 073 S01

Advanced Mathematics 2

Spring 2015

Instructor:	Crystal Lomas (May 4 - Jun 24)	Dr. Patrick Montgomery (Jun 24 - Aug 13)
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Office Hours:	Mondays and Wednesdays 4:30 pm – 5:20 pm	

Class Meeting Times: Mondays and Wednesdays 5:30 pm-7:50 pm

Class Location: Ewing 346

Course Objectives: The main goals for this course are:

- To learn the basic algebraic skills necessary to succeed in future math courses and in your chosen field of study. This involves learning the vocabulary, notation, rules, and techniques of intermediate algebra, as well as solving applied problems.
- To master arithmetic operations (without the help of a calculator).
- To learn to write mathematics correctly.
- To be able to explain the concepts involved in problem solving.

Important Dates:

May 4	First day of Math 072/073 Self-Paced Class
May 18	Victoria Day – College closed
May 19	Fee Deadline
July 1	Canada Day – College closed
July 6	Last day to withdraw from the course or change to audit
Aug. 3	BC Day – College closed
Aug. 13	Last day of instruction for Math 072/073 class
Aug. 13	Last day to write tests or Final Exam

Prerequisites: **Recent C+ or higher** in (MATH 072 or 135); OR
Recent C or higher in (Principles of Math 11 or Pre-calculus 11 or Foundations of Math 12); OR
Recent assessment

Required Grade: A **B** or higher is needed in MATH 073 to continue into Math 115 or 172. **C+ or higher** is necessary to continue into MATH 107. **C or higher** is necessary to continue into Math 109, 112, or 113.

Textbook: ***Intermediate Algebra, 11th Edition, Marvin Bittinger (required)***
Trigonometry Booklet (packaged with the new copies of the textbook) (required)

Calculator Policy: The only calculator permitted for use in most Math courses at Camosun (including this one) is the **Sharp EL-531X** scientific calculator.

No calculators will be allowed on Test 1, Test 3, and part of the final exam. It is good practice to only use a calculator when it is absolutely necessary, even in places where calculators are allowed.

Access Math Lab: Ewing 342 and Ewing 224 This drop-in centre is freely available for your use to work on math homework and to seek help from the tutor on staff (see hours posted on door).

Additional Resources: **DVDs** are available on reserve in the main library; **videotapes** are available at the Math Help Centre E342.

Workload: The course completion time will vary for each student, depending on a number of factors to be discussed with the instructor when the individual learning plan is developed. Factors include the students' beginning level of math skills, motivation, learning rate, and how much time they can actually study and attend class. It takes 2-4 hours to read through one section and do both the margin exercises and enough exercises in the exercise set to feel comfortable with the material. There are 36 sections in this course; this means that you have between **72-144 hours of work** ahead of you not including study time for tests and the final exam! If you work 5 days a week on this course, then you need to put in 2-4 hours a day to finish the course in one term. There is lots of help available; you can ask me questions during class or during office hours, and you can get help from the math tutors in the help centres.

Grades: This course is comprised of 5 term tests (50% of your mark) and a final exam (50% of your mark).

If you get less than 65% on a term test, you must rewrite it. If you get 65% or higher on a term test, you can choose to rewrite it once. There are no rewrites for the final exam.

You can choose to write each test when you feel you are ready, but you must get permission from your instructor to write. All tests and the final exam are written in the math lab in E342 during math lab hours; the math lab hours are posted on the math lab door and also online. It will take approximately 1.5 hours to write each term test and approximately 3 hours to write the final exam.

To re-register for this course for one extra term, you must have at least 75% of the work done or at least 75% attendance.

If you wish to complete the course in one term, you should plan to write a test every 2-3 weeks.

Grade Scale:

0-49	50-59	60-64	65-69	70-72	73-76	77-79	80-84	85-89	90-100
F	D	C	C+	B-	B	B+	A-	A	A+

NS You will be assigned a "no show" grade if you do not attend the first class and you do not contact your instructor within two days of the first class. Your seat may have been given away to a waitlisted student. If room is available, you may re-register for the course with permission of the instructor.

W If you find that you are too busy to work on the course, then you need to officially withdraw before July 6 to avoid getting an F for the course.

IP An "in-progress" grade is only given in self-paced courses. If you have not finished the course at the end of the term but have attended at least 75% of the classes or have successfully completed at least 3 unit tests

that term, then you may be awarded an IP grade. You may only receive two IP grades for a course; the third time you register for the course, you will be assigned an F if you do not complete the course.

Academic Progress: The College has an academic progress policy to improve your likelihood of success. To view the policy, see Sec E-1.1 on the policy webpage http://camosun.ca/about/policies/policies.html.

Learning Support There are a variety of services available to assist you throughout your learning. This information is available in the College calendar, at Student Services, or the college web site at camosun.ca.

Student Conduct There is a Student Conduct Policy which includes plagiarism. It is your responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, at Student Services and on the College website in the Policy Section http://camosun.ca/about/policies/policies.html.

Course Content: MATH 073 is the second half of an intermediate algebra and trigonometry course. Math 072 & 073 together articulate as Principles of Math 11. However, those of you who have taken Math 11 will notice that 072 has quite a different flavour; we emphasize both numeracy and algebra and trigonometry skills using only a basic scientific calculator when necessary. Topics include operations on polynomials, factoring, rational expressions and equations, rational exponents, radicals and radical equations, quadratic equations and functions, right angle trigonometry and the sine and cosine laws. Applications are seen throughout the course.

Unit 1 is review for those who have taken MATH 072 recently. If you have completed MATH 072 within the last month, you do not need to write the Unit 1 test; you may use your MATH 072 mark for Ch 4 instead.

We cover the following sections in the textbook:

Unit 1:	Ch 4	Review of Basic Algebra	4.1 - 4.8
Unit 2:	Ch 5	Solving Linear Equations and Inequalities	5.1 - 5.8
Unit 3:	Ch 6	Graphs, Functions, and Applications	6.1 - 6.8
Unit 4:	Ch 7	Systems of Equations	7.1 - 7.7a
Unit 5:		Trigonometry (separate booklet)	5.1, 5.2, 5.3, 7.1, 7.2

HOMEWORK for Unit 1 (Ch 4) - NO CALCULATOR

Unit 1	Section	Margin Exercises	A Bit More Practice	Lots More Practice
4.1	Introduction to polynomials	All	25, 29, 75, 79	1 – 29, 35 - 79
4.2	Multiplication of polynomials	All	41, 43, 75, 79, 81, 89, 91, 103	1 – 91, 103
4.3	Introduction to factoring	All	23, 27, 37 – 41, 49, 57 – 64 all, 65, 67, 75, 77	11 – 49, 57 – 64 all, 65, 67, 75, 77
4.4	Factoring trinomials of the form: $x^2 + bx + c$	All	13, 17, 23, 25, 39	1 – 39
4.5	Factoring trinomials of the form: $ax^2 + bx + c, a \neq 1$	All	Start with the FOIL method (trial and error); switch to the ac-method as needed 33 – 51, 69 – 81	1 – 51, 69 – 81
4.6	Special factoring	All	1 – 10 , 27, 29, 41, 51, 59 – 67, 89, 91, 99, 103, 105, 125, 131	1 – 105, 125, 131
4.7	Factoring strategy	All	21 – 27, 33, 37, 41 – 53, 59 – 69	1 – 53, 59 – 69
4.8	Applications	All	9, 13, 15, 25, 31, 33, 35, 41, 47, 49, 55, 57, 63 - 83	1 – 57, 63 – 83
Properties and formulas		1. classification of polynomials by the number of terms and degree 2. squaring a binomial (in your head) 3. factoring formulas (diff. of squares, sum/diff of cubes) 4. Principle of Zero Products		
Function notation		Sections 2.2, 4.1, 4.2		
Word problems in Section 4.8		Know the Pythagorean Theorem and the formulas for the area of a square, rectangle and triangle (inside back cover of textbook)		
Chapter 4 Test: all		No peeking at the answers until you have finished the test! Grade yourself; hard questions are worth 2 marks each and the other questions are worth 1 mark each. If you are satisfied with the results, then great! If you want more practice, choose from the suggestions below.		
Review Exercises		Find questions in these exercises that are similar to the ones that you had trouble with in the chapter test.		

HOMEWORK for Unit 2 (Ch 5)

Unit 2	Section	Margin Exercises	A Bit More Practice	Lots More Practice
5.1	Rational expressions	All	7, 17, 27, 39, 49, 55, 57, 75 – 79	1 – 57, 75 – 79
5.2	Addition and subtraction	All	5, 11, 19, 21, 25, 29, 33 – 41, 47, 51, 53, 61, 67, 69, 71	1 – 73
5.3	Polynomial division	All	5, 13, 15, 17, 19, 29, 31, 33	1 – 35, 47 – 50
5.4	Complex fractions	All	19, 23, 25, 27, 29, 31	1 – 31, 45 – 53
5.5	Solving rational	All	15, 19, 31, 33, 41, 49,	1 – 45, 48 – 55 all

	equations		55	
5.6	Applications and proportions	All	1 – 29	1 – 29
5.7	Formulas	All	7, 9, 17, 19, 21, 25	1 – 25
5.8	Variation	All	13, 23, 35, 41, 43	1 – 59
Properties and formulas		1. Work Principle: Please ask for help if you don't understand why this works. 2. Direct, Inverse and joint Variation		
Chapter 5 Test: 1-33		No peeking at the answers until you have finished the test! Grade yourself; hard questions are worth 2 marks each and the other questions are worth 1 mark each. If you are satisfied with the results, then great! If you want more practice, choose from the suggestions below.		
Review Exercises		Find questions in these exercises that are similar to the ones that you had trouble with in the chapter test.		

HOMEWORK for Unit 3 (Ch 6) - NO CALCULATOR

Unit 3	Section	Margin Exercises	A Bit More Practice	Lots More Practice
6.1	Radical expressions & functions	All	7, 11, 33, 37, 43, 45, 49, 53, 55, 63 – 69, 73, 79, 85, 89	1 – 37, 43 – 79, 83 – 92
6.2	Rational exponents	All	23 – 33, 39, 43, 49, 53, 55, 65, 67, 71, 75, 77, 81, 83	1 – 83, 87 – 90
6.3	Simplifying radicals	All	13, 19, 27, 29, 35 – 45, 57, 61, 63, 75, 79, 85, 87, 97a	1 – 65, 71 – 97a
6.4	Operations with radicals I	All	19, 29, 35, 47, 67 – 75, 79 – 86, 93, 97	1 – 75, 79 – 86, 93, 97
6.5	Operations with radicals II	All	7, 11, 15, 19, 25, 31, 35 – 37, 41	1 – 31, 35 – 37, 41
6.6	Solving radical equations	All	11, 17, 19, 23, 35, 41, 43, 57, 61 – 72, 77, 85	1 – 43, 55, 57, 61 – 72, 77, 85
6.7	Applications	All	21 – 29, 33 – 40, 43	1 – 15, 21 – 29, 33 – 40, 43
6.8	Complex numbers		17, 31, 47, 51, 55, 57, 63, 77, 81, 91, 93, 97, 101 – 108	1 – 97, 101 – 108
Properties and Formulas		Definition of rational exponents: $x^{m/n} = \left(\sqrt[n]{x}\right)^m$ or $x^{m/n} = \sqrt[n]{x^m}$ Definition of principle root (when to use absolute value with radicals) Definition of i and i^2 : $\sqrt{-1} = i$ and $i^2 = -1$.		
Chapter 6 Test		1 – 46		
Review Exercises		All		

HOMEWORK for Unit 4 (Ch 7)

Unit 4	Section	Margin Exercises	A Bit More Practice	Lots More Practice
7.1	The basics of solving quadratic equations	All	3, 17, 33, 41, 49, 53, 68, 69	1 – 59, 68 - 73
7.2	The Quadratic Formula	All	11, 17, 21, 29, 33, 35, 43, 61, 63	1 – 43, 47 – 54, 61, 63
7.3	Applications	All	1 – 29, 37, 39, 43, 47	1 – 29, 31 – 47
7.4	More on quadratic equations	All	7, 23, 25, 27, 35, 37, 45, 47, 55, 63 – 66, 73	1 – 57, 63 – 66, 73
7.5	Graphing I	All	21, 23, 32 - 34	1 – 25, 29 – 34
7.6	Graphing II	All	7 – 11, 13, 19, 23, 31, 35	1– 21, 23 – 28, 31, 35
7.7	Mathematical modelling (only a)	Only #1	1 – 17	1 – 17, 37 – 44
Properties and Formulas		Definition of rational exponents: $x^{m/n} = \left(\sqrt[n]{x}\right)^m$ or $x^{m/n} = \sqrt[n]{x^m}$ Definition of principle root (when to use absolute value with radicals) Definition of i and i^2 : $\sqrt{-1} = i$ and $i^2 = -1$.		
Chapter 7 Test		1 – 19		
Review Exercises		All		

HOMEWORK for Unit 5 (Trigonometry)

Unit 5	Section	Margin Exercises	A Bit More Practice	Lots More Practice
5.1	Trig functions of acute angles		**NC** before a group of questions means that you should not use a calculator for these questions **NC** 1 – 29, 31 – 81 **NC** 83 – 97	Same as previous column
5.2	Applications of right triangles		7 – 21, 25 – 31	1 – 21, 25 – 31
5.3	Trig functions of any angle		1 – 23, **NC** 25 – 77, 83 - 105	Same as previous column
7.1	The Law of Sines		1, 3, 5, 9, 13, 15, 25, 27, 29	1 – 15, 25, 27, 29
7.2	The Law of Cosines		1, 3, 7, 9, 13, 17, 19, 21, 25, 29, 31	1 – 23, 25, 27, 29, 31
Properties and Formulas		5.1 right triangle definitions of the 6 trig. Functions definitions of the reciprocal functions labelling of special triangles degrees, minutes and seconds 5.2 angle of elevation and depression bearings (first type) 5.3 angle in standard position reference triangle co-ordinate definitions of the trigonometric functions (p29) reference angle bearings of the second type (p38) 7.1 sine law (including the ambiguous case) 7.2 cosine law		

HOMEWORK for Final Exam

Practice Final	Pick up a copy of the Practice Final and Solutions from me. Do several questions before checking the answers to better simulate a testing experience.
Vocabulary and Rules	domain of a function classification of polynomials square of a binomial diff. of squares, sum & diff. of cubes factoring strategy principle of zero products Pythagorean Theorem compare simplifying an expression with solving an equation direct, inverse and joint variation principal square root of a^2: $\sqrt{a^2} = \lvert a \rvert$ simplifying $\sqrt[k]{a^k}$ definition of $a^{m/n}$ laws of exponents rationalizing the denominator $\sqrt{-1} = i$ and $i^2 = -1$; complex conjugates principle of square roots: $x^2 = d \Rightarrow x = \pm\sqrt{d}$ solving quadratics by completing the square quadratic formula: $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ discriminant: $b^2 - 4ac$ parabola: vertex, line of symmetry writing a quadratic function in graphing form by completing the square (note the similarities and differences with solving quadratics by completing the square) back cover perimeter and area: square, rectangle, triangle, circle Trig5.1 right triangle definitions of the six trig functions; definitions of the reciprocal functions; labeling of special triangles; degrees, minutes and seconds Trig5.2 angle of elevation and depression, bearings (first type) Trig5.3 angle in standard position, reference triangle, co-ordinate definitions of trig functions (p29), reference angle, bearing of the second type (p38) Trig7.1 sine law (including the ambiguous case) Trig7.2 cosine law
Word Problems	Sections 4.8, 5.6, 5.8, 6.7, 7.3, 7.7 Trig booklet: 5.2, 5.3, 7.1, 7.2
Rearranging Formulas	Section 5.7, 7.3
Chapter Tests & Review Exercises	If you are having trouble with a particular chapter, redo that chapter test and/or some of the review exercises for that chapter.

Tips for Success

1. Come to class every day. If you don't attend class, it's easy to fall behind and much tougher to catch up as you have to relearn the material.

2. Do the suggested exercises from your course outline. Work through the problems thoughtfully, not just to get them done. Think about what the instruction means, what a similar question might look like on the test and what are some of the pitfalls that you need to avoid.

3. Try to find time to do at least a bit of math at least 5 days a week. On your timetable, schedule time each day for your math homework; it is really important to establish a routine. You can't put your math course on the back burner and hope to cram it in at the end.

4. Do the questions thoughtfully rather than just trying to get them over with! Think about the principles and strategies involved.

5. If you don't understand something, seek help right away from your instructor or from the tutors in the Math Lab in E224 and E342.

6. Keep working, stay positive and do the best you can given all the other demands in your life.

Class Protocol

1. Sign in so your instructor knows that you're attending.

2. Bring your textbook, calculator and work materials to every class.

3. Work quietly. I encourage you to help each other but please keep the noise level down and keep cell phones on vibrate mode. If you would like to work with a partner or in a group, please feel free to use the math lab. If you would like to take a break from math (and this is totally understandable) please chat outside the classroom.

4. If you bring snacks to class please tidy up afterwards. Let me know if you have any relevant allergies.

5. If you need help and I'm with another student, please put your name on the board so I know you're waiting. If others are waiting, I may have to limit the time I spend with you (e.g. 2 questions at a time).

6. When doing the exercises, label each question clearly, write out the question and show your work. This makes it easy to review for the test and to get help if you don't understand.

7. If you have trouble with an exercise, highlight the question and make a note in your margin about what you don't understand. When you ask for help in class, bring the question and your work for the instructor to see. Be organized!

MATH 073 Suggested Pacing Schedule Spring 2015

- Please note that you can take up to 2 terms to complete a course if you need it.
- Some chapters may require more time, others less. You can write tests anytime the math lab is open, not just on class days.

Wk		Monday	Tuesday	Wednesday	Thursday	Friday
1	May	4 4.1	5 4.2	6 4.3	7 4.4	8 4.5
2		11 4.5	12 4.6	13 4.6	14 4.7	15 4.7
3		18 *Victoria Day*	19 4.8	20 4.8	21 Review Ch 4	22 Unit 1 Test
4		25 5.1	26 5.2	27 5.3	28 5.4	29 5.4
5	June	1 5.5	2 5.6	3 5.6	4 5.7	5 5.8
6		8 Review Ch 5	9 Review Ch 5	10 Unit 2 Test	11 6.1	12 6.2
7		15 6.3	16 6.4	17 6.4	18 6.5	19 6.5
8		22 6.6	23 6.6	24 6.7	25 6.8	26 Review Ch 6
9	July	29 Review Ch 6	30 Unit 3 Test	1 *Canada Day*	2 7.1	3 7.2
10		6 7.3	7 7.3	8 7.4	9 7.4	10 7.5
11		13 7.5	14 7.6	15 7.7	16 7.7	17 Review Ch 7
12		20 Review Ch 7	21 Unit 4 Test	22 Trig 5.1	23 Trig 5.2	24 Trig 5.2
13		27 Trig 5.3	28 Trig 5.3	29 Trig 7.1	30 Trig 7.1	31 Trig 7.2
14	Aug	3 *BC Day*	4 Trig Review	5 Unit 5 Test	6 Final Review	7 Final Review
15	Aug 10-13: **Catch-up week**; last chance to write a test or final exam is **Thursday, Aug 13th**.					

My MATH 073 Pacing Schedule Spring 2015

Wk		Monday	Tuesday	Wednesday	Thursday	Friday
1	May	4	5	6	7	8
2		11	12	13	14	15
3		18 *Victoria Day*	19	20	21	22
4		25	26	27	28	29
5	June	1	2	3	4	5
6		8	9	10	11	12
7		15	16	17	18	19
8		22	23	24	25	26
9	July	29	30	1 *Canada Day*	2	3
10		6	7	8	9	10
11		13	14	15	16	17
12		20	21	22	23	24
13		27	28	29	30	31
14	Aug	3 *BC Day*	4	5	6	7
15	Aug 10-13: **Catch-up week**; last chance to write a test or final exam is **Thursday, Aug 13th.**					