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School of Arts & Science
MATHEMATICS DEPARTMENT

MATH 105 Sections 01 & 02
Algebra and Pre-Calculus
Fall 2008
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COURSE OUTLINE

Ω *Please note: this outline will be electronically stored for five (5) years only.
It is strongly recommended students keep this outline for your records.*

1. Instructor Information

(a)	Instructor:	Peggy Tilley	
(b)	Office Hours:	Mon, Wed & Fri 12:00 – 12:20 & 2:00 – 3:00 Tues & Thurs 10:00 – 11:00	
(c)	Location:	E244	
(d)	Phone:	(250) 370-3502	Alternative Phone:
(e)	Email:	tilley@camosun.bc.ca	
(f)	Website:	peggytilley.googlepages.ca	

2. Intended Learning Outcomes
(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)

Upon completion of this course the student will be able to:

1. Simplify expressions involving rational exponents, radicals, polynomials and ratios of polynomials.
2. Solve linear, quadratic, and rational equations and inequalities.
3. Identify and correct common algebraic errors.
4. Evaluate functions, find the domain of functions, compose and decompose functions and find inverse functions.
5. Graph polynomial and rational functions using symmetry, intercepts, long run behaviour, asymptotes and a table of signs.
6. Use the Rational Zero Theorem to factor polynomials.
7. Find all solutions (real and complex) for polynomial equations.
8. Graph exponential and logarithmic functions and their transformations.
9. Prove the properties of logarithms and use these properties to simplify expressions, and solve equations and applied problems.
10. Graph the six trigonometric functions and their transformations and the three basic inverse trigonometric functions.
11. Use the unit circle definitions to derive the Pythagorean identities, the sum and difference formulas, and the double angle and half angle formulas. Use these identities to simplify expressions, solve equations and verify other identities.
12. Use trigonometric functions to model real-life problems involving cyclical patterns.
13. Complete the squares and graph parabolas, circles, ellipses and hyperbolas. Solve applied problems using the reflective properties of parabolas.

14. Evaluate limits numerically, graphically and algebraically, find derivatives using the definition and find equations of tangent lines.
15. Read and write mathematics at a level sufficient for entry into first year calculus.

3. Required Materials

(a) **Texts**   Math 105 & 107 Exercise Sets (sold in the bookstore)

(b) **Calculator**   Sharp EL 531

4. Course Content and Schedule

The minimum recommended prerequisite is a **recent** C+ in either Math 11 or MATH 073. If you have not completed Math 11 within the past 2 years, then you probably want to refresh in either 072/073 or perhaps just 073 (all tuition free courses) this term. Please come and see myself or the chair of the math department for advice.

Math 107 is a lighter version of Math 105. If you need a UT Math 12 equivalent course for applied calculus or a BA degree or a UVic degree in biology, psychology, geography or business, then probably Math 107 is the course for you. If you need Math 100 (calculus for math, computer science, physics, chemistry, geology, etc) or are heading for an engineering technology at Interurban or BCIT, then you need 105. If you don't require a UT math course and want to cover the Math 12 material more slowly, then take the two term tuition free sequence 092/093 instead.
Confused? Please come to office hours and we can talk about your options.

MATH 105 is an algebra and precalculus course. The main topics are algebra and brief look at conic sections, functions, polynomial functions, rational functions, exponential and logarithmic functions, trigonometric functions and their inverses, trigonometric identities and equations. A brief introduction to calculus is provided throughout the course.

The course is divided into 7 sections. Each section is tested during the term on either a take-home or an in-class test. In addition, there is a trigonometry proof test in week 14. All tests are based on the homework in the Math 105 & 107 Exercise Sets. Test dates and due dates for take-homes are shown on the course calendar attached to this outline. There is also a comprehensive final exam in week 15 or 16.

Solutions are posted immediately after a test or assignment is handed in and so **late assignments cannot be accepted and there are no rewrites for missed tests**. If you miss a test or take-home for any reason (illness, family emergency, etc) then the weight of that work goes on the final exam. Please see the grade calculation below.

5. Basis of Student Assessment (Weighting)
(1) There are 3 in-class term tests, 4 take-homes and a trigonometry proof test. To be **eligible to write the final exam,** you must have received a grade of 50% or higher on at least one term test **and** at least one take-home **and** the trigonometry proof test. (If you prefer not to hand in any term work, then register as a challenge student and pay only ½ the course fee. Your change in registration needs to happen within the first 2 weeks of the term.)

(2) Your grade will be automatically computed three ways and you will be awarded the **highest** of the three marks. If you miss a test, then Option 3 is not available.

Option 1: Term Grade 20% & Final Exam 80%

Term Grade for Option 1 is calculated as follows:

X = highest of these 5 marks: 4 take-homes & trig proof test

Y = highest of the 3 in-class tests

If X > Y, then Term Grade = Y

If X < Y, then Term Grade = (X+Y)/2

Option 2: Term Grade 40% & Final Exam 60%

Term Grade for Option 2 is calculated as follows:

X = average of best 4 of these 5 marks: 4 take-homes & trig proof test

Y = average of best 2 of 3 in-class tests

If X > Y, then Term Grade = Y

If X < Y, then Term Grade = (X+Y)/2

Option 3: Term Grade 60% & Final Exam 40%

Term Grade for Option 3 is calculated as follows:

X = average of best 4 of these 5 marks: 4 take-homes & trig proof test

Y = average of all 3 in-class tests

If X > Y, then Term Grade = Y

If X < Y, then Term Grade = (X+Y)/2

6. Grading System

(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)

Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D	Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite.	1
0-49	F	Minimum level has not been achieved.	0

Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy E-1.5 at **camosun.ca** for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description

I	*Incomplete*: A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	*In progress*: A temporary grade assigned for courses that, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. *(For these courses a final grade will be assigned to either the 3rd course attempt or at the point of course completion.)*
CW	*Compulsory Withdrawal:* A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.

7. **Recommended Materials or Services to Assist Students to Succeed Throughout the Course**

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services or the College web site at camosun.ca.

STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**.
It is the student's 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 web site in the Policy Section.

Exit Grade You Need:	If you are heading for Math 100 (calculus for students in mathematics, computing science, physics, chemistry, geology, etc), then you need a **B** in Math 105. For most other math courses and programs, a grade of C in Math 105 is sufficient. Note that many of our college programs and courses require C+ in Math 12 or C in Math 105 or 107 or 115.

Tips for Success:

1. Attend every class and get the most out of class time. Don't be afraid to ask and answer questions. Don't worry about answering a question wrong. I like wrong answers – it gives me a chance to correct misconceptions. I often give you a bit of time to start or finish a question before I write up the solution on the board. Please use that time to work on the problem or to get help from, or give help to, the person beside you. Please turn off and put away your cell phone. Checking and sending messages is not a smart (or polite) use of class time. Copying notes for a class that you missed rather than working hard on the new material is also not the best (or polite) use of class time.

2. Do your homework every day. Math is not a spectator sport; understanding what we do in class is only the first step. Work through lots of exercises and really think about the ideas; don't just try to get your homework over with! On your timetable, schedule time each day for your math homework; it is really important to establish a routine. You can't put this course on the back burner and hope to cram it in at the end.

3. Work with a classmate (a study buddy) some of the time. It's fun and you will see whether you really understand something when you try to explain it to someone else.

4. Please ask for help before you fall behind or become frustrated. If you can't get the correct answer, bring me your work so that I can see what you are thinking. I like to spend time explaining what is going wrong as well as nudging you towards a correct answer. Don't save up your questions until you have a long list; I find I can be more effective working with you on just one or two ideas at a time. Be a frequent user of the math room and my office hours.

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

Good luck

MATH 105 Homework   Fall 2008

Help is available in the math help labs (E224 or E342) and from me (E244) and your classmates. A good strategy is to go to a math room after class and to work on your homework there. Also help is available online **peggytilley.googlepages.com**. See Topic Links and go to the appropriate chapter and section.

Usually the best approach is to do the current day's homework first – reinforce it while it is still fresh. Then, if you have time, go back and catch up on any outstanding homework.

Pg	Section		Homework – **no** calculator for units 1 & 2
P1:A1	1.1	Real Numbers	To help me learn faces and names, please send me your picture: tilley@camosun.bc.ca 2d, 3d, 4c, 5d, 6c, 7d, 8d, 9, 10, 11, 12, 13, 14, (15c,d,e), 16a, 17
P4:A4	1.2	Integer Exponents	1f, (2c,d), 4, (5a,b,d,f), 7
P6:A6	1.3	Rational Exponents & Radicals I	1d, 2b, (3e,f,g), (4d,e,f), 7, (8c,d,e,f), 9, 11, 12, 13
P8:A9	1.4	Radicals II	(1d,e,f), (2d,e), 3c, 5, 6, (8c,d,e), (9d,e), 10, 11, 12, 13, 14, (15b,e), 16, (19c,e,f)
P13:A13	1.5	Polynomials	1, 2, (5e,f), 6, (7a,e,g), 9, 10, 11, 12
P15:A15	1.6	Factoring I	1, (2b,d,e,f), (3d,e,f), 4, (5b,c,d), 6c, (7b,d), (8b,d), (9c,d), (10c,d,e), (11c,d,e,f,g,h), (12b,d,e), 13, 14
P18:A18	1.7	Factoring II	1, (2b,c,d), 3c, 4, (5c,d), (6a,b), 7, 8, 9a, 10, (11b,d), (12a,b)
P21:A21	1.8	Rational Expressions	1d, (2d,e,f), 3, (6c,d), 7d, (8a,b,c), 9, 10c, (11c,d,e), (12b,c), 13, 14
P25:A24	1.9	Complex Fractions	2d, (3b,c,e), (4a,c,h), 5d,(6b,c), (7c,d), (8a,b,d,e)
P1:A1	2.1	Linear Equations & Inequalities	1, 3, (6b,c), 7, 8, 9, 11, 12, (13a,d), (14a,b)
P4:A5	2.2	Quadratic Equations	1, 2, 3, 4, 5, 6c, (7c,d), 8 in class, (9b,c), 10, 11, 12, 13, 14, 15
P7:A9	2.3	Equations Involving Rational Expressions	1b, (2e,f), 3, 4, 5, (6c,d,e), 7 in class, 8b, 9, (10b,c,d,e,i), 11
P10:A13	2.4	More Equations	(1a,c,e,g), 2, 3, 4, (5b,c), 6, (7a,b), (8a,b), (9a,b,c,d), (10a,b,c)
P12:A16	2.5	Polynomial & Rational Inequalities	(1a,b,c), 2, (3c,d), 4, (5a,b,c,d)
P14:A20	2.6	Distance, Midpoint & Slope	(1b,c), 2, 4, 5b, 7, 8, 9, 10a, 11, 12, 13, 14, 15, 16

Pg		Section	Homework – **no** calculator for units 1 & 2
P16:A23	2.7	Linear Equations in Two Variables	1, 2, (3a,c), 4a, 5, (6c,e), (7b,c,e), (8b, c), 9, 10, 11 in class
P19:A26	2.8	Circles	1d, 2, 3, (4a,b,c), (5a,b), 6, (7a,c), 8
P21:A28	2.9	Ellipses & Hyperbolas	1 in class, 2, 3, (In the directions, delete "and the equations of the asymptotes": 4a,c,d), (5a,b,c), 6, 7 (calculator)
P23:A32	2.10	Systems of Equations in Two Variables	1b, 2b, (3a,c), (4a,b,c), 5, 6,7
P1:A1	3.1	What is a Function?	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16 in class, 17, 18, 19
P5:A4	3.2	Piecewise Defined Functions; Constructing Functions	1a, 2b, 3, 4, 5, 6, 7 (In part a, the final answer is correct but the work is wrong), 8 in class, 9, (10a,b,c), 11, 12, 14
P8:A8	3.3	Function Notation & Difference Quotients	(1a,c,h,i,l), 2, 3, 4, 5, 6, 7, 8
P10:A11	3.4	A Library of Functions	1, 2, 3 & 4 in class, 5, 6, 7, (8a,c,d), 9, 10a, 11, 12, 13
P14:A14	3.5	Domains, X-intercepts & Symmetry	2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13
P17:A18	3.6	Translating & Reflecting	1, 2, (3c, e), 4, 5, 6, 7, 8, 9, 10, 11a, 12
P22:A22	3.7	Stretching/Shrinking	1 in class, 2, (3d,e,f), 4, 5c, 6, 7, 8b, 9, 10, 11, 12
P28:A27	3.8	Combinations of Functions	1, 2, 3a, 4, 5, 7c, 8, 9, 10, 11a, 12, 13
P1:A1	4.1	Limits	1, 2, 3, 4, 5, (6d,e), 7, (8a,b,c)
P4:A4	4.2	The Derivative	(1b,c,d), 2, 3, 4, 5, 6, 7, 8
P6:A8	4.3	Graphing Polynomial Functions	2 in class, 3, (5a,b,c,d), 6, 7
P9:A13	4.4	Asymptotes, Holes & Intercepts	1, 2, 3, 4, 5, 6, 8, 9, 10
P11:A16	4.5	Graphing Rational Functions	1, (2c,d,e,f), 3, 4, 5

P1:A1	5.1	Inverse Functions	1, 2, 3, 4, 6a, 7b, 8, 10, 11, 12, 13, 14, 16
P6:A6	5.2	Graphing Exponential Functions	1, 2, (3c,d,e), 4, 5, 6, 7 – 9 in class (ans for 9a should be $\sinh(-x) = -\sinh(x)$)
P9:A9	5.3	Working with Exponential Functions	1, 2, 3, 4b, 5, 6, 7 in class, 8
P11:A12	5.4	An Introduction to Logarithms	1, 2, 3, 4, 5, (6c,d), 7, (8a,d), 9, 10, 11, 12, 13
P14:A15	5.5	Logarithmic Functions	1, 2, 3, 4a, 5, 6, (7c,d), 8, 9, 10, 11, 12, 13, 14, 15, (16a,b,c,d)
P18:A20	5.6	Properties of Logarithms	1, 2, 3, 4, 5, 6, 7, 8, 9, 10 & 11 in class, 12, 13, 14, 15, 16, (17a,b),19, 21
P23:A26	5.7	Exponential Equations & Compound Interest	1, 2, 3, 4, 5b, 6, (7b,c), 8, 9b, 10a, (11a,b,c,d,e), 13
P26:A30	5.8	Exponential Growth & Decay	3, 4 in class, 5, 6, 7, 8, 9, 10, 11
P28:A32	5.9	Logarithmic Equations & Applications	1, 2, 3, 4, 5, 7, 8, 9
P1:A1	6.1	Radian Measure	1, 2, 3, 4, 5b, 6, (7c should be 1° & 7d should be π°), 8b, (9b answer is 8.73 cm), (10a,b), 11
P4:A3	6.2	The Sine & Cosine Functions	1, 2, 3, 4 in class, 5, 6, 7, 8, 9, 10, 11, 13, 14
P8:A6	6.3	Pythagorean Identities	1, 2, 3, 4, 5, 6, 7, 8, 10
P11:A11	6.4	Transformations of Sine & Cosine	1, 2, 3, 4, 5, (6a,b,c,d), 7, 8
P13:A14	6.5	Modelling with Sine & Cosine	1, 2, 3, 4, 5, 6
P15:A16	6.6	Other Trig Graphs	1–4 in class, 5, 6, 7, 8, 9
P18:A20	6.7	Right Triangle Trigonometry	1, 2c, 4, 5, 6, 7, 8, 9, 10, 12, 13 in class, 14, 15, 16
P22:A23	6.8	Trig Functions of Any Angle	1, 2b, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13a, 14, 15, 16
P26:A25	6.9	Trigonometric Equations	1, 2, 3, 4, 5, 6 (ans for 6e is $\tan x = \dfrac{\sqrt{36-\pi^{2}}}{\pi}$), 8, 9

P1:A1	7.1	Verifying Identities	1, 2, 3, 5, 6, 7, 8, 9, 12, 13
P5:A9	7.2	Sum & Difference Identities	1, (2a,b,c), 3, (4b,4c,4d), 5, 6, (7a,c), **8****
P7:A11	7.3	The Derivatives of Sine & Cosine	OMIT
P8:A13	7.4	Double Angle Identities	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, (11a,c,e,g,h)
P11:A19	7.5	Power Reducing Formulas	1, 2, 3, 4 The answers should be numbered 1 – 4 instead of 14 – 17. Also, there is an error in my solution for #3 ; I forgot to double the angle. Ask if you want help.
P12:A20	7.6	Half Angle Identities	1, 2, (3a,c,d), 4, 5a, 6a, 7
P14:A22	7.7	Graphing Inverse Trig Functions	1 in class, 2, 3, 4, 5 & 6 in class, 7, 8, 9, 10, 14
P19:A27	7.8	Compositions with Inverse Trig Functions	1 & 2 & 3 warm-up as needed, (4f,g,h,i,j), (5c,d,e), (6a,b,c,d), (7a,b,c,d), (8a,b,c), (9a,b,c), (10e,f,g,h), 11, 12, 13
P24:A33	7.9	More Trig Equations	1, 2, 3, 4, (5a,b,c,d,e)

Tentative Pacing Schedule Math 105 – Fall 2008

The numbers in the table refer to sections in the Math 105 & 107 Exercise Sets sold in the Camosun bookstore.

Wk		Monday	Tuesday	Wednesday	Thursday	Friday
1	Sept	1 Holiday	2 1.1	3 1.2	4 1.3	5 1.4
2		8 1.5	9 1.6	10 1.7	11 1.8	12 1.9
3		15 2.1	16 2.2 **Due 2:30 pm: Part 1 of Take-home 1**	17 2.3	18 2.4 **Due 2:30 pm: Part 2 of Take-home 1**	19 2.5
4		22 2.6	23 2.7	24 2.8	25 2.9	26 2.10
5	Oct.	29 3.1	30 3.2 **Due 2:30 pm: Part 1 of Take-home 2**	1 3.3	2 3.4 **Due 2:30 pm: Part 2 of Take-home 2**	3 3.5
6		6 **3.6**	7 3.7	8 3.8	9 *4.1*	10 4.2
7		13 Holiday	14 4.2/4.3	15 **Test 1 – Ch 3**	16 4.3	17 4.4
8		20 4.5	21 5.1	22 5.2	23 5.3 **Due 2:30 pm: Part 1 of Take-home 3**	24 5.4 **Due 2:30 pm: Part 2 of Take-home 3**
9		27 5.5	28 5.6	29 5.7	30 5.8	31 5.9
10	Nov.	3 Catchup	4 **Test 2 – Ch 5** Withdrawal date	5 6.1	6 6.2	7 6.3
11		10 6.4	11 Holiday	12 6.5	13 6.6	14 6.7
12		17 6.8	18 6.9	19 7.1	20 7.2	21 7.4
13		24 7.5	25 **Test 3 – Ch 6**	26 7.6	27 *7.7*	28 7.8
14	Dec	1 7.9	2 **Trig Proof Test**	3	4 **Due 2:30 pm Part 1 of Take-home 4**	5 **Due 2:30 pm Part 2 of Take-home 4**
15		Mon 8 – Sat 13 Final exams are timetabled by registration; the exam schedule is posted on Camlink at the end of October. Don't book holiday plans until **Dec 17**.				
16		Mon 15 – Tues 16 Final exams continue				