

MA 103 College Algebra

Thomas Spring, SM
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Honolulu, Hawaii

Fall 1998, Day Session

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Course Expectations

Professor: Bro. Tom Spring, SM

Text: *Algebra for College Students* by Gustafson/Frisk. Brooks/Cole 1995. 4th Edition.

Strategy: The first six chapters of the text are essentially review and we will do this work in small groups. After that, more lecture will be mixed in with the group work. The three tests that will be given during the semester will be done in the small groups. Thus, each group will hand in one test. I will make a judgment as to the quality of each student's participation in the group work. Absences and tardies will adversely affect that judgment.

Calculator: You may use a calculator at any time unless I specify otherwise.

Assignments: There will be weekly assignments which are due the last day of each week. They will be handed out the first day of each week.

Tests: We will have three in-class tests that will be a small group effort. Each group will hand in one test.

Final Exam: The Final Exam is scheduled for Thursday, 17 December 1998 at 8:00 a.m. It will be a group effort. Each group will hand in one final.

Quizzes: Quizzes will be given every two weeks. They will be individual and oral. They will be held in my office and will last about ten minutes. We will have to work out scheduling and this will demand some flexibility from both you and me. Each will cover the work we have done during the two weeks preceding the quiz.

Service Learning Option: One way to learn math is to teach math to others. I invite you to consider the following options: **One:** tutor at a nearby elementary school for ten or more hours during the semester; **Two:** write eight brief papers (one page) on the topics listed later in this syllabus. The details of these options are presented in the appropriate pages accompanying this syllabus.

Grade: Your grade will be determined by averaging your final exam with the averages of the grades you obtain in quizzes, assignments, tests and the Service Learning Option. Your participation in small group can affect your grade. My grading scale is: 100 - 93 = A; 92 - 85 = B; 84 - 77 = C; 76 - 70 = D; 70 - 0 = F. This is a demanding scale. Read the description of grades given in the current catalog on page 41.

Assistance: I am able and eager to assist you. The various ways of contacting me are given in the masthead of this sheet. My office hours are posted and I can easily make appointments.

You can also receive assistance in the **Math Lab** in HH 20. It will be open around 21 September. No appointment is needed.

The **Learning Center** will provide you with a tutor. You must make an appointment. The LC is on the bottom floor of Eiben Hall.

Walter Paddington: His mission in life is to witness to such attitudes as: there is more to life than mathematics, success is more than high grades, each of us is unconditionally loved, each of us is a wonderful mystery. Walter is available for consultation at any time. Consultation generally takes the form of hugging and holding.

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The Service Learning Option

In this section of College Algebra, I offer an option between two different ways of learning. One option is to write short papers on eight designated mathematical topics. The second option is to tutor young students in math and reflect, in writing, on your experience of that service.

Either way is a way of learning. The writing of papers on mathematical topics helps you to learn because you must know a subject well before you can explain it in writing. Tutoring helps you to learn because you must present a topic clearly in order for the student to be able to learn it.

Option One: Writing

The eight topics are described on a separate paper in this syllabus.

Papers should be typewritten or word processed, double spaced. You will need extra spaces so that you can write in equations and formulas.

No paper should be longer than two sides.

The papers will be graded on their neatness, clarity of presentation and use of original examples.

The due dates for the papers are given in the Course Calendar in this syllabus.

Option Two: Tutoring

The requirement is to tutor for ten weeks, at least one hour a week, at Aliiolani School (on Waialae between Sixth and Seventh) or at Kuhio School, at the intersection of King and Old Waialae across from the Humane Society.

Tutors are required to complete a weekly journal. I provide the journal questions and the paper. The journal due dates are given in the Course Calendar.

There is also a two page reflection paper in which the tutor will review the entire tutoring experience. This paper must be typed or word processed, double spaced. Its due date is on the course calendar.

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Syllabus

Real numbers, their properties and the four operations performed on them.

Order of operations; absolute value; integral exponents.

Polynomials and the four operations performed on them.

Equations: linear, quadratic, with rational expressions.

Radicals, their properties and the four operations performed on them.

Radical equations.

Rational exponents.

Functions: linear, quadratic; graphs; function concept; domain; range.

Exponential function: properties, graph, applications.

Logarithmic function: properties, graph, applications; properties of logarithms.

Binomial theorem.

Sequences, series.

Mathematical induction.

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Writing Assignments

Writing Assignment #1:

Tell in narrative detail how to solve the equation: $2x + 7 = 15$.

Tell in narrative detail how to solve the equation: $3x + 5(x - 2) = 6$.

“Narrative” means using good sentences.

Writing Assignment #2:

Write a narrative as you complete each of these instructions. A narrative means good sentences.

What does x^6 mean?

What does x^2 mean?

Now use those understandings to prove that $x^6 \cdot x^2 = x^{6+2}$.

The generalization of what you just “proved” is the formula $x^m \cdot x^n = x^{m+n}$.

Again using x^6 and x^2 , “prove” the following generalizations:

$$x^m/x^n = x^{m-n} \text{ and } (x^m)^n = x^{mn}.$$

Writing Assignment #3:

If $0 < x < 1$, which is bigger: x^2 or \sqrt{x} ? Why?

Explain what the question is asking; tell what all the symbols mean. Use good sentences when you do this.

Writing Assignment #4:

Give some examples of the distributive property: one example with just numbers; one with only variables, a couple of examples with numbers and variables. Include some examples where the sign inside the parentheses is + and some examples where it is -.

In your own words and in good sentences, tell what the distributive property means. Also give at least one example of where you have used the distributive property in working a problem.

Writing Assignment #5:

Tell in narrative detail how to solve the equation $4x/3 + 6 = 5$.

Tell in narrative detail how to solve the equation $3/4 + 5x = 7/2$.

Again, narrative means using good sentences.

Writing Assignment #6:

Tell in narrative detail how to solve the equation

$$\frac{3}{x - 2} + \frac{5}{x} = 1$$

Writing Assignment #7:

Respond to each question in a complete sentence.

- | | |
|---|---|
| 1. What is the opposite of 2? | 2. What is the sum of 2 and its opposite? |
| 3. What is the opposite of a ? | 4. What is the sum of a and its opposite? |
| 5. What is the opposite of $a + 2$? | 6. What is the sum of $a + 2$ and its opposite? |
| 7. What is the opposite of $3a^2 + a + 2$? | |

Tell how you can be sure that you got the opposite of $3a^2 + a + 2$ correct?

The symbol for "opposite of" is the minus sign. The opposite of 2 is symbolized: -2.

The opposite of a is symbolize $-a$. The opposite of $a + 2$ is symbolized $-(a + 2)$.

Write $-(a + 2)$ without parentheses. Write $-(3a^2 + a + 2)$ without parentheses.

Write $-(4x^2 - 6x - 7)$ without parentheses.

Write a sentence or two telling how to remove the parentheses from an expression when there is a minus sign in front of it. Tell how you can check that your answer is correct.

Writing Assignment #8:

Describe in narrative detail at least three ways to solve the equation $3x^2 + 5x = -2$.

MA 103 Calendar

Week #	Dates	Assignments	Writing Tests	Final
01	August 31			
	September 02			
	September 04	#1		
02	September 09		#1	
	September 11	#2		
03	September 14			
	September 16			
	September 18	#3		
04	September 21		#2	
	September 23			
	September 25	#4		
05	September 28			
	September 30			#1
	October 02	#5		
06	October 05		#3	
	October 07			
	October 09	#6		
07	October 14			
	October 16	#7		
08	October 19		#4	
	October 21			
	October 23	#8		
09	October 26			
	October 28			
	October 30	#9		
10	November 02		#5	
	November 04			#2
	November 06	#10		
11	November 09			
	November 13	#11		
12	November 16		#6	
	November 18			
	November 20	#12		
13	November 23			
	November 25	#13		
14	November 30		#7	
	December 02			#3
	December 04	#14		
15	December 07			
	December 09			
	December 11	#15		
Thu	December 17		#8	8:00 a.m.