MATH 1051 PRECALCULUS I FALL 2002

Lecture 010 MWF 10:10-11:00am VinH 16

Lecture 040 MWF 02:30-03:20pm AndH 270

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Textbooks.

1. M. Sullivan, K. Murphy, and M. Sullivan, *Algebra Review*, Prentice Hall, 1996 (referred as SMS).

2. M. Sullivan, *Precalculus*, 6th Edition, Prentice Hall, 2002 (referred as S).

Course content. The course will be a review of high school algebra. We will start from recalling properties of polynomials and rational expressions. Then we will review exponents and radicals and after that we will have the first midterm. Next topic will be the Cartesian coordinates, graphs of elementary functions, and the graphing techniques. Then we will discuss notion of function, basic properties of functions, and some mathematical modeling. Then there will be the second midterm. We will make a good review of graphing the polynomials and rational functions. After that we will consider the exponential and logarithmic functions, and then we will have the third midterm. The rest of the semester will be devoted to logarithmic and exponential equations and some of their applications.

Homework and quiz arrangements. Homework problems are listed for each section in the Lecture Schedule attached to the syllabus. Your TA will collect, and grade some subsets of the problems on the list, and will be responsible for all arrangements to do with homework and quizzes which take place in recitation.

Absence from exams. Missing a midterm is permitted only for the most compelling reason. Except in extraordinary situations, permissions should be obtained in advance from the professor to miss an exam; otherwise you will be awarded a 0. If you are excused from taking a midterm, you course grade will be determined by giving extra weight to the final exam. Except in extremely exceptional situations, a student who misses the final exam fails the course.

Incompletes. These are given only in exceptional circumstances. The student must have satisfactorily completed all but a small portion of the work in the course, have a compelling reason for the incomplete, and must have a prior arrangements with the professor for how the incomplete will be removed, well before the end of the term.

Grading policy.

Your course grade is based on:

1) Your performance on recitation sessions: You will have 5 quizzes and one cumulative grade for the completed homeworks. The maximum grade for each quiz and for the accumulating grade is 100. Your Recitation Score then is computed as the average of these 6 grades. The Recitation Score is 15% of the Semester Score.

2) Your performance on midterms: You will have three midterms each of maximum 100. Each midterm grade is 15% of the Semester Score.

3) Your performance on the final exam: The grade for the final is 40% of the Semester Score (assuming that the final has maximum of 100).

Again, the final exam gives 40%, each midterm gives 15%, and the Recitation Score gives 15% of the Semester Score.

Note: An S is equivalent to C or better.

Lecture Schedule for Math 1051 Lectures 010 and 040

(subject to small changes without prior notice).

No. (Text)	**Sections to cover**	**HW**	**LE**
1. (SMS)	1.5. Real numbers. 1.6. Inequalities. Absolute value. Distance between two points on a real number line. 1.7. Constants and variables. Mathematical models.	1.5: *69, 79*; 1.6: *9, 13, 19, 25, 27, 29, 35, 40, 45, 49*; 1.7: *1, 7, 9, 17, 29, 36*	1.5: *70*; 1.6: *7, 18, 50*; 1.7: *2, 36*
2.–3. (SMS)	2.2. Polynomials, addition and subtraction of polynomials. 2.3. Multiplication of polynomials. Horizontal and vertical multiplication. FOIL method. 2.5 Factoring of second degree polynomials.	2.2: *43,52*; 2.3: *9, 17, 31, 41, 59, 73, 79, 87*; 2.5: *13, 25, 47, 53, 67, 69, 79*	2.1: *47*; 2.2: *17, 44*; 2.3: *6, 12, 25, 95, 97*; 2.4: *5, 9, 48, 57*; 2.5: *4, 65, 68, 80*
3. (SMS)	2.6. Division of polynomial by monomial. Division of polynomial by polynomial.	2.6: *7, 9, 15, 19, 23, 29, 31, 35, 39, 43, 45, 49*	2.6: *21, 25, 34, 50*
4. (SMS)	3.2. Reducing rational expressions top lowest terms. Evaluating rational expressions. 3.3: Multiplication and division of rational expressions.	3.2: *11, 27, 31, 39, 43, 57, 63*; 3.3: *9, 19, 23, 33, 39, 47, 59, 67*	3.2: *22, 32, 40, 58*; 3.3: *22, 25, 56, 69*
5. (SMS)	3.4. Addition and subtraction of rational expressions. Least common multiple.	3.4: *7, 11, 17, 25, 31, 39, 47, 49, 65, 69, 71, 73*	3.4: *13, 16, 36, 22, 41, 51, 72*
6. (SMS)	3.5. Mixed quotients. Method 1. Method 2.	3.5: *3, 7, 11, 15, 17, 21, 23, 25, 29, 31, 33*	3.5: *1, 16, 22, 27*
7. (SMS)	4.1. Negative exponents. Laws of exponents. Scientific notation. 4.2. Square roots. Radical sign. Principle square root and perfect square roots. Products and quotients of square roots. Rationalizing.	4.1: *7, 15, 25, 37, 43, 53, 59, 63, 73*; 4.2: *9, 19, 29, 35, 47, 53, 61*	4.1: *11, 13, 44, 52, 69, 81*; 4.2: *6, 27, 36*
8. (SMS)	4.3. Radicals. Principal n-th root of a number a. Properties of radicals.	4.3: *3, 9, 11, 23, 27, 29, 35, 41, 45, 49, 55, 59, 61*	4.3: *1, 2, 4, 10, 27, 31, 30, 47*
9. (SMS)	4.4. Rational exponents. 4.6. Geometry topics. Pythagorean theorem. Area formulas.	4.4: *9, 11, 15, 19, 23, 29, 31*; 4.6: *11, 17, 25, 33, 35, 37*	4.4: *6, 8, 32*; 4.6: *8, 34, 38*
10. (S)	1.1. Rectangular coordinates (Cartesian coordinate system). Quadrants. Distance between points. Midpoint formula.	1.1: *2, 4, 5, 7, 11, 17, 19, 23, 25, 29, 33, 39, 45, 47, 51, 55*	1.1: *8, 20, 26, 35*
11.	MIDTERM		
12.–13. (S)	1.2. Graph of an equation in two variables. Intercepts. Finding intercepts from an equation. Symmetry. Circle. graphing a circle whose equation is in general form.	1.2: *1, 7, 11, 13, 20, 23, 27, 29, 37, 42, 45, 49, 52, 54, 55, 59, 75, 82*	1.2: *4, 14, 25, 43, 47, 63, 69*

No. (Text)	Sections to cover	HW	LE
13.–14. (S)	1.3. Line. Slope of a line. Graphing a line given a point an a slope. Equations of lines. Point-slope form of an equation of a line. Finding an equation of a line given two points. Slope-intercept form of an equation of a line. General form of equation of a line. Parallel and perpendicular lines. Finding parallel and perpendicular lines to a given.	1.3: *3, 7, 10, 14, 16, 19, 23, 27, 38, 43, 48, 50, 51, 53, 71, 74, 75, 81, 85, 87*	1.3: *11, 25, 40, 52, 78*
15.–16. (S)	2.1. Relations and functions. Function notation. Finding a value of a function. Domain of a function. Graph of function. Obtaining information from from the graph of function. Obtaining information about the graph of function. Applications.	2.1: *1, 3, 7, 10, 16, 19, 25, 29, 31, 37, 39, 46, 47, 56, 73, 75, 85*	2.1: *5, 17, 32, 46, 48, 54*
17. (S)	2.2. Properties of functions. Average rate of change. Increasing, decreasing, or constant function. Local maximum and minimum. Even and odd functions.	2.2: *1, 3, 5, 7, 9, 12, 17, 21, 23, 29, 31, 35, 37, 41, 49, 53*	2.2: *18, 22, 36, 47, 55*
18.–19. (S)	2.3. Library of functions. Piece-wise defined functions.	2.3: *1, 3, 5, 6, 7, 11, 12, 14, 15, 18, 19, 22, 23, 31, 33, 39, 41, 43*	2.3: *16, 20, 28, 34*
20. (S)	2.4. Graphing techniques. Vertical shifts, horizontal shifts. Compressions and stretches. Reflections about X-axis and Y-axis.	2.4: *1, 3, 5, 6, 13, 17, 20, 21, 25, 29, 31, 35, 48, 55, 57, 69, 71*	2.4: *23, 26, 36, 49, 70*
21. (S)	2.5. Sum, difference, product, and quotient of two functions. Composite of two functions. Calculus applications.	2.5: *1, 3, 7, 9, 11, 13, 15, 21, 23, 27, 38, 41, 49, 51, 55, 57*	2.5: *10, 12, 20, 42, 56*
22. (S)	2.6. Mathematical models. Constructing and analyzing functions.	2.6: *1, 5, 7, 11, 15, 19, 26, 35, 37*	2.6: *8, 13, 31*
23.	MIDTERM		
24. (S)	3.1. Quadratic functions. graphing quadratic function. Quadratic models. Fitting a quadratic function to data.	3.1: *1, 3, 5, 7, 13, 15, 17, 23, 27, 29, 34, 41, 43, 54, 63, 65*	3.1: *18, 30, 47, 52*
25.–26. (S)	3.2. Polynomial functions. Power function. graphing polynomial function using transformations. Identifying zeros and their multiplicities. End behavior.	3.2: *1, 5, 9, 11, 14, 23, 26, 27, 29, 35, 36, 45, 47, 61, 66, 71, 72*	3.2: *21, 30, 37, 51*
27.–28. (S)	3.3. Rational functions. Finding the domain of a rational function. Using transformations to graph a rational function. Finding asymptotes.	3.3: *1, 3, 6, 7, 11, 13, 17, 23, 26, 27, 31, 33, 35, 44*	3.3: *12, 28, 39, 42*
29.–30. (S)	3.4. Rational functions II. Graphing rational function. Applications	3.4: *1, 3, 9, 13, 16, 28, 34, 36, 39, 41, 43*	3.4: *5, 26, 35, 40, 47*

No. (Text)	Sections to cover	HW	LE
31. (S)	3.5. Polynomial rational inequalities.	3.5: *1, 3, 5, 10, 13, 25, 31, 33, 41, 44, 45, 54*	3.5: *6, 11, 23, 29, 43*
32. (S)	4.1.Inverse of a function. One-to-one functions. Geometric interpretation. Finding the inverse.	4.1: *2, 3, 5, 7, 11, 13, 15, 17, 23, 28, 29, 37, 46, 51, 54, 55, 59*	4.1: *6, 8, 12, 18, 27, 50*
33.–34. (S)	4.2. Exponential function. Graphs of exponential functions. The base e. Exponential equations.	4.2: *1, 3, 11, 13, 16, 20, 25, 30, 34, 35, 40, 44, 48, 50, 54, 61, 74, 75*	4.2: *23, 33, 39, 47, 52, 76*
34.–35. (S)	4.3. Logarithmic function. Relating logarithms to exponents. Domain of logarithmic function. Graphs of logarithmic function. Logarithmic equations.	4.3: *1, 5, 10, 12, 13, 19, 22, 29, 31, 34, 43, 45, 51, 57, 77, 81, 84, 89, 100*	4.3: *6, 21, 26, 27, 52, 65, 66, 68, 71, 73, 78, 79, 83, 85, 86, 90*
36.	MIDTERM		
37.–38. (S)	4.4. Properties of logarithms. Using a calculator to evaluate logarithms with arbitrary bases. Exponential and logarithmic models.	4.4: *2, 3, 5, 7, 11, 14, 16, 26, 35, 40, 45, 47, 51, 56, 59, 62, 69, 72*	4.4: *4, 6, 8, 12, 15, 18, 23, 29, 37, 41, 50, 54, 60, 61, 71*
39.–40. (S)	4.5. Logarithmic and exponential equations.	4.5: *1, 5, 8, 10, 13, 16, 17, 20, 21, 23, 29, 31, 33, 37, 39, 41, 43*	4.5: *2, 7, 14, 19, 24, 28, 32, 42*
41.–42. (S)	4.6. Simple interest formula. Future value of money. Compound interest formula. Continuous compounding. Effective rate of interest. Present value of money. Doubling and tripling time for the investment.	4.6: *1, 2, 8, 9, 11, 12, 18, 21, 25, 28, 29, 32, 36, 37, 45, 48*	4.6: *4, 10, 15, 17, 23, 41*