

Elementary Algebra Syllabus

MAT K095 CRN 12145 Spring 2014
Three Rivers Community College Norwich, CT 06360
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Course Description

Through lecture, discussion of material, and practice, this course continues the development of algebraic concepts and skills.

Objectives

This course extends the basic algebra skills acquired in MAT K075. The topics include signed numbers, solving first-degree equations, exponents, polynomials, and factoring, graphing, systems of linear equations, inequalities, radicals, and scientific notation. This course does not count towards the minimum requirements for graduation.

Method of Evaluation

- 1) Take Home Assignments 25%
- 2) Tests 50%
- 3) Final 25%

Take Home Assignments will be due one week after they are assigned. Students are encouraged to work together on take home assignments, but each student is responsible for understanding the material. Late assignments will be accepted one class after they are due with 5 points taken off. A zero will assigned for any take home which is not handed in before or during the grace period.

Tests will be announced one week in advance. If you are going to be absent the day of a test, you **must** let me know, by email or phone before or on that day. Failure to do so will result in a zero for that test.

Final will be comprehensive.

Academic Integrity

Academic integrity is essential to a useful education. Failure to act with academic integrity severely limits a person's ability to succeed in the classroom and beyond. Furthermore, academic dishonesty erodes the legitimacy of every degree awarded by the College. In this class and in the course of your academic career, present only your own best work; and act at all times with honor.

ALL CELL PHONE WILL BE SHUT OFF AND PUT AWAY DURING CLASS

Grades	Equivalent	Quality Points
A	93-100	4.0
A-	90-92	3.7
B+	87-89	3.3
B	83-86	3.0
B-	80-82	2.7
C+	77-79	2.3
C	73-76	2.0
C-	70-72	1.7
D+	67-69	1.3
D	63-66	1.0
F	Below 63	0.0

Required Text

Elementary and Intermediate Algebra, 4th edition, Bittinger, Ellenbogen, Johnson, Addison-Wesley.
Also, graph paper is required.

Disabilities Statement

If you have a disability that may affect your progress in this course, please meet with a Disability Service Provider (DSP) as soon as possible. You can make an appointment with a DSP by calling (860) 383-5217. Please note:

- 1.) For academic adjustments, you will have to provide documentation of your disability to the DSP.
- 2.) Instructors cannot provide adjustments until you have delivered written authorization (from a DSP) to the instructor.
- 3.) Adjustments take effect when you deliver your written authorization to the instructor in person (provided there is adequate time for the instructor to make necessary arrangements).
- 4.) Adjustments do not apply to tests/assignments that were due prior to your delivering written authorization to your instructor in person.

College Withdrawal Policy

Students may withdraw, at the Registrar's Office, for any reason on or before May 12, 2014.

Resources

Free tutoring is available at the Tutoring and Academic Success Center (TASC).
Please use the service as needed.

After the successful completion of the course the student will be able to:

1. Rational Numbers:

- a) Identify and distinguish between rational and irrational numbers
- b) Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2 , $\sqrt{8}$)

2. Expressions and Equations with Polynomials, Rational and Radical Expressions, and Integer Exponents:

- a) Interpret parts of an expression, such as terms, factors, and coefficients and evaluate expressions for a given replacement value(s)
- b) Add, subtract, and multiply polynomials. Divide polynomials by a monomial
- c) Construct and interpret equations as two expressions set equal to each other
- d) Manipulate formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's Law $V = IR$ to highlight resistance R
- e) Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = \frac{1}{3^3} = \frac{1}{27}$
- f) Use square root symbols to represent solutions to equations of the form $x^2 = p$, where p is a positive rational number
- g) Evaluate square roots of perfect squares
- h) Know that numbers such as $\sqrt{2}$ are irrational
- i) Express very large or very small quantities in scientific notation
- j) Perform operations with numbers expressed in scientific notation

3. Linear Equations in One Variable:

- a) Solve linear equations and inequalities in one variable
- b) Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms
- c) Create linear equations and inequalities in one variable and use them to solve real world applications
- d) Recognize examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions

4. Linear Equations in Two Variables:

- a) Interpret the rate and unit rate as the slope of the graph
- b) Derive the equation $y = mx + b$ for a line intercepting the vertical axis at b and having a slope of m
- c) Identify parallel and perpendicular lines based on their slopes
- d) Graph a linear equation in two variables
- e) Construct a linear equation to model a linear relationship between two quantities. Determine and interpret the rate of change and initial value from a description of a relationship or from two (x, y) values, including reading these from a table or graph
- f) Construct linear equations given a graph, a description of a relationship, or two input-output pairs (include reading these from a table) using point-slope form and slope-intercept form

5. Systems of Linear Equations:

- a) Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs
- b) Solve systems of two linear equations in two variables algebraically (using both substitution and addition methods), graphically (by hand and/or technology), Solve simple cases by inspection. *For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6*
- c) Recognize systems of linear equations with one solution, infinitely many solutions, or no solutions
- d) Solve real-world problems leading to two linear equations in two variables

6. Functions:

- a) Understand that a function is a rule that assigns to each input exactly one output and that the graph of a function is the set of ordered pairs consisting of an input and the corresponding output
- b) Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line
- c) Use functions to model linear relationships between quantities
- d) Use function notation. Evaluate functions for inputs in their domains
- e) Graph linear functions and show intercepts
- f) Recognize that linear functions have a constant rate of change and interpret the rate of change in the context of the problem

7. Applications:

- a) Apply geometrical formulas for two and three-dimensional figures such as rectangles, circles, rectangular solids, cylinders, spheres, etc.
- b) Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two dimensions

Mathematical Practices

- 1) Make sense of problems and persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 3) Construct viable arguments and critique the reasoning of others.
- 4) Model with mathematics.
- 5) Use appropriate tools strategically.
- 6) Attend to precision.
- 7) Look for and make use of structure.
- 8) Look for and express regularity in repeated reasoning

Homework

1.3 Fractions	5-83E00
1.4 Positive and Negative Real Numbers	19, 21, 23, 37, 39, 63-71 Odd, 75, 77, 79, 81, 89, 91
1.8 Exponential Notation and Order of Operations	3-57 Odd, 63-79 Odd, 89, 91, 93, 95
2.1 Solving Linear Equations	11-63Odd
2.2 More on Solving Linear Equations	7-63 Odd
2.3 Formulas	9-37E00
2.4 Applications with Percent	19-23 Odd, 33-69 Odd
2.5 Problem Solving	1, 3, 7, 13, 15, 17, 19, 24, 27, 31, 39
2.6 Linear Inequalities in One Variable	13-39E00, 67-95E00
2.7Sovling Applications with Inequalities	1-25 Odd
3.1 Equations and the Rectangular Coordinate System	27, 29, 41-55 Odd
3.2 Graphing Linear Equations	9-15 Odd, 21-45 Odd, 73, 77, 81
3.3 Graphing and Intercepts	7-81E00
3.4 Rate of Change	1-43 Odd
3.5 Slope	1-65 Odd
3.6 Slope-Intercept Form	1-33 Odd, 37-91E00
3.7 Point-Slope Form	1-97E00
3.8 Functions	9-101E00
4.1 Solving Systems of Linear Equations Graphically	9-35 Odd
4.2 Solving Systems of Linear Equations by Substitution	1-51E00
4.3 Solving Systems of Linear Equations by Elimination	5-29 Odd, 39, 43, 47, 49
4.4 Applications Using Systems of Equations	1-15 Odd, 19-29 Odd, 37
4.5 Solving Equations by Graphing	1-9
5.1 Exponents and Their Properties	9-37 Odd, 49-53, 63-81 Odd
5.2 Negative Exponents and Scientific Notation	11-51 Odd, 83-97 Odd, 103-111 Odd, 117-127 Odd
5.3 Polynomials and Polynomial Functions	9-27 Odd, 33-47 Odd, 55, 57, 59, 65, 67, 71-83 Odd
5.4 Addition and Subtraction of Polynomials	11, 13, 33, 37, 39
5.5 Multiplication of Polynomials	1-59 Odd, 79-87 Odd
5.6 Special Products	5-41 Odd, 51-55, 85-95 Odd
5.8 Division of Polynomials by a Monomial	5-17