

ALEKS[®] Course Syllabus

Course Name: Math 00024	Course Code: N/A
ALEKS Course: College Algebra	Instructor: Master Templates
Course Dates: Begin: 08/15/2014 End: 08/15/2015	Course Content: 207 topics
Textbook: Barnett/Ziegler/Byleen/Sobecki: College Algebra, 9th Ed. (McGraw-Hill)	

Chapter R - Basic Algebra Operations (94 topics, no due date)

Section R.2 (36 topics)

- Exponents and integers: Problem type 1
- Exponents and integers: Problem type 2
- Introduction to the product rule of exponents
- Product rule with positive exponents: Multivariate
- Introduction to the power of a power rule of exponents
- Introduction to the power of a product rule of exponents
- Power rules with positive exponents: Multivariate products
- Power rules with positive exponents: Multivariate quotients
- Power and product rules with positive exponents
- Evaluating expressions with exponents of zero
- Evaluating an expression with a negative exponent: Positive fraction base
- Evaluating an expression with a negative exponent: Negative integer base
- Quotient rule with negative exponents: Problem type 1
- Power of a power rule with negative exponents
- Power rules with negative exponents
- Scientific notation with positive exponent
- Scientific notation with negative exponent
- Square root of a perfect square monomial
- Cube root of an integer
- Converting between radical form and exponent form
- Rational exponents: Non-unit fraction exponent with a whole number base
- Rational exponents: Negative exponents and fractional bases
- Rational exponents: Powers of powers with negative exponents
- Simplifying the square root of a whole number less than 100
- Simplifying a radical expression with an even exponent
- Simplifying a radical expression with two variables
- Simplifying a higher root of a whole number
- Simplifying a higher radical expression: Multivariate
- Square root addition or subtraction
- Square root multiplication: Advanced
- Simplifying a product involving square roots using the distributive property: Advanced
- Special products of radical expressions: Conjugates and squaring
- Rationalizing a denominator: Quotient involving square roots
- Rationalizing a denominator: Square root of a fraction
- Rationalizing a denominator using conjugates: Integer numerator
- Rationalizing a denominator using conjugates: Square root in numerator

Section R.3 (25 topics)

- Degree and leading coefficient of a univariate polynomial
- Simplifying a sum or difference of two univariate polynomials
- Multiplying a univariate polynomial by a monomial with a positive coefficient
- Multiplying binomials with leading coefficients of 1
- Multiplying binomials in two variables
- Multiplying conjugate binomials: Univariate
- Squaring a binomial: Univariate
- Multiplication involving binomials and trinomials in two variables

- Greatest common factor of two multivariate monomials
- Factoring out a monomial from a polynomial: Univariate
- Factoring out a monomial from a polynomial: Multivariate
- Factoring a univariate polynomial by grouping: Problem type 1
- Factoring a univariate polynomial by grouping: Problem type 2
- Factoring a multivariate polynomial by grouping: Problem type 1
- Factoring a quadratic with leading coefficient 1
- Factoring a quadratic with leading coefficient greater than 1: Problem type 1
- Factoring a quadratic with leading coefficient greater than 1: Problem type 2
- Factoring a quadratic in two variables with leading coefficient greater than 1
- Factoring a perfect square trinomial with leading coefficient 1
- Factoring a difference of squares in one variable: Basic
- Factoring a difference of squares in one variable: Advanced
- Factoring a difference of squares in two variables
- Factoring a product of a quadratic trinomial and a monomial
- Factoring a sum or difference of two cubes
- Factoring out binomials from a polynomial: GCF factoring, advanced

Section R.4 (15 topics)

- Quotient of expressions involving exponents
- Simplifying a ratio of polynomials: Problem type 1
- Multiplying rational expressions involving multivariate monomials
- Multiplying rational expressions involving quadratics with leading coefficients of 1
- Dividing rational expressions involving multivariate monomials
- Dividing rational expressions involving quadratics with leading coefficients of 1
- Adding rational expressions with denominators ax and bx : Basic
- Adding rational expressions with denominators ax and bx : Advanced
- Adding rational expressions with linear denominators without common factors: Basic
- Adding rational expressions with linear denominators without common factors: Advanced
- Complex fraction involving univariate monomials
- Complex fraction: GCF factoring
- Complex fraction: Quadratic factoring
- Complex fraction made of sums involving rational expressions: Problem type 1
- Complex fraction made of sums involving rational expressions: Problem type 2

Chapter R Supplementary Topics (18 topics)

- Operations with absolute value: Problem type 2
- Product rule with negative exponents
- Power, product, and quotient rules with negative exponents
- Multiplying numbers written in scientific notation: Basic
- Dividing numbers written in scientific notation: Basic
- Factoring a multivariate polynomial by grouping: Problem type 2
- Factoring with repeated use of the difference of squares formula
- Using substitution to factor polynomials
- Simplifying a ratio of polynomials: Problem type 2
- Least common multiple of two monomials
- Adding rational expressions with common denominators and binomial numerators
- Adding rational expressions with multivariate monomial denominators: Advanced
- Adding rational expressions involving different quadratic denominators
- Complex fraction involving multivariate monomials
- Complex fraction made of sums involving rational expressions: Problem type 4
- Rational exponents: Products and quotients with negative exponents
- Simplifying a sum or difference of radical expressions: Multivariate
- Simplifying a product of radical expressions: Multivariate

Chapter 1 - Equations and Inequalities (45 topics, no due date)

Section 1.1 (15 topics)

- Solving for a variable in terms of other variables using multiplication or division: Advanced
- Solving for a variable in terms of other variables using addition or subtraction with division
- Solving for a variable inside parentheses in terms of other variables
- Solving for a variable in terms of other variables in a linear equation with fractions
- Solving a value mixture problem using a linear equation
- Solving a distance, rate, time problem using a linear equation
- Finding the perimeter or area of a rectangle given one of these values
- Finding the original price given the sale price and percent discount
- Solving a percent mixture problem using a linear equation

- Solving a rational equation that simplifies to linear: Denominator x
- Solving a rational equation that simplifies to linear: Denominator $x+a$
- Solving a rational equation that simplifies to linear: Denominators a , x , or ax
- Solving a rational equation that simplifies to linear: Unlike binomial denominators
- Solving for a variable in terms of other variables in a rational equation: Problem type 1
- Solving a work problem using a rational equation

Section 1.2 (3 topics)

- Set builder and interval notation
- Solving a linear inequality with multiple occurrences of the variable: Problem type 3
- Solving a compound linear inequality: Graph solution, basic

Section 1.3 (5 topics)

- Introduction to solving an absolute value equation
- Solving an absolute value equation: Problem type 1
- Solving an absolute value equation: Problem type 2
- Solving an absolute value inequality: Problem type 3
- Solving an absolute value inequality: Problem type 4

Section 1.5 (13 topics)

- Solving an equation written in factored form
- Finding the roots of a quadratic equation with leading coefficient 1
- Finding the roots of a quadratic equation with leading coefficient greater than 1
- Solving a word problem using a quadratic equation with rational roots
- Solving a quadratic equation using the square root property: Exact answers, basic
- Solving a quadratic equation using the square root property: Exact answers, advanced
- Completing the square
- Solving a quadratic equation by completing the square: Exact answers
- Applying the quadratic formula: Exact answers
- Discriminant of a quadratic equation
- Solving a word problem using a quadratic equation with irrational roots
- Solving a rational equation that simplifies to quadratic: Binomial denominators, constant numerators
- Solving a rational equation that simplifies to quadratic: Binomial denominators and numerators

Section 1.6 (6 topics)

- Solving a radical equation that simplifies to a linear equation: One radical, basic
- Solving a radical equation that simplifies to a linear equation: Two radicals
- Solving a radical equation that simplifies to a quadratic equation: One radical, basic
- Solving a radical equation that simplifies to a quadratic equation: One radical, advanced
- Solving an equation that can be written in quadratic form: Problem type 1
- Solving an equation that can be written in quadratic form: Problem type 2

Chapter 1 Supplementary Topics (3 topics)

- Solving an absolute value equation of the form $|ax+b| = |cx+d|$
- Solving an absolute value inequality: Problem type 5
- Solving a rational equation that simplifies to quadratic: Proportional form, advanced

Chapter 2 - Graphs (20 topics, no due date)

Section 2.1 (4 topics)

- Graphing a linear equation of the form $y = mx$
- Graphing a line given its equation in slope-intercept form: Integer slope
- Graphing a line given its equation in slope-intercept form: Fractional slope
- Graphing a parabola of the form $y = ax^2$

Section 2.3 (17 topics*)

- Graphing a linear equation of the form $y = mx$
- Graphing a line given its equation in slope-intercept form: Integer slope
- Graphing a line given its equation in slope-intercept form: Fractional slope
- Graphing a line given its equation in standard form
- Graphing a vertical or horizontal line
- Finding x - and y -intercepts of a line given the equation: Advanced
- Finding slope given the graph of a line on a grid

- Finding slope given two points on the line
- Finding the slope of horizontal and vertical lines
- Graphing a line through a given point with a given slope
- Finding the slope and y-intercept of a line given its equation in the form $Ax + By = C$
- Writing an equation in slope-intercept form given the slope and a point
- Writing an equation of a line given the y-intercept and another point
- Writing the equation of the line through two given points
- Writing the equations of vertical and horizontal lines through a given point
- Finding slopes of lines parallel and perpendicular to a line given in the form $Ax + By = C$
- Writing equations of lines parallel and perpendicular to a given line through a point

Chapter 2 Supplementary Topics (2 topics)

- Graphing a line by first finding its x- and y-intercepts
- Graphing a line by first finding its slope and y-intercept

(*) Some topics in this section are also covered in a previous section of this Objective.
Topics are only counted once towards the total number of topics for this Objective.

Chapter 3 - Functions (16 topics, no due date)

Section 3.1 (6 topics)

- Identifying functions from relations
- Vertical line test
- Evaluating functions: Linear and quadratic or cubic
- Evaluating functions: Absolute value, rational, radical
- Domain and range from ordered pairs
- Finding inputs and outputs of a function from its graph

Section 3.2 (1 topic)

- Domain of a rational function: Excluded values

Section 3.3 (1 topic)

- Graphing a parabola of the form $y = ax^2$

Section 3.4 (7 topics)

- Solving a word problem using a quadratic equation with irrational roots
- How the leading coefficient affects the shape of a parabola
- Finding the x-intercept(s) and the vertex of a parabola
- Finding the maximum or minimum of a quadratic function
- Word problem involving the maximum or minimum of a quadratic function
- Solving a quadratic inequality written in factored form
- Solving a quadratic inequality

Chapter 3 Supplementary Topics (1 topic)

- Solving an equation with positive rational exponent

Chapter 4 - Polynomial and Rational Functions (6 topics, no due date)

Section 4.4 (6 topics)

- Domain of a rational function: Excluded values
- Finding the asymptotes of a rational function: Constant over linear
- Finding the asymptotes of a rational function: Linear over linear
- Finding horizontal and vertical asymptotes of a rational function: Quadratic numerator or denominator
- Graphing a rational function: Constant over linear
- Graphing a rational function: Linear over linear

Chapter 5 - Exponential and Logarithmic Functions (22 topics, no due date)

Section 5.1 (8 topics)

- Finding the initial amount in a word problem on continuous compound interest
- Finding the final amount in a word problem on continuous compound interest
- Solving an exponential equation by finding common bases: Linear and quadratic exponents
- Solving an exponential equation by finding common bases: Linear exponents

- Finding a final amount in a word problem on exponential growth or decay
- Table for an exponential function
- Graphing an exponential function: $f(x)=b^{-x}$ or $f(x)=-b^{ax}$
- Graphing an exponential function: $f(x)=b^x$

Section 5.2 (4 topics*)

- Evaluating an exponential function that models a real-world situation
- Evaluating an exponential function with base e that models a real-world situation
- Finding the final amount in a word problem on continuous compound interest
- Finding the final amount in a word problem on continuous exponential growth or decay

Section 5.3 (4 topics)

- Converting between logarithmic and exponential equations
- Converting between natural logarithmic and exponential equations
- Evaluating logarithmic expressions
- Solving an equation of the form $\log_b a = c$

Section 5.5 (4 topics)

- Solving a multi-step equation involving a single logarithm: Problem type 2
- Solving a multi-step equation involving natural logarithms
- Finding the final amount in a word problem on compound interest
- Solving a multi-step equation involving a single logarithm: Problem type 1

Chapter 5 Supplementary Topics (3 topics)

- The graph, domain, and range of an exponential function
- Graphing a logarithmic function: Basic
- The graph, domain, and range of a logarithmic function

(*) Some topics in this section are also covered in a previous section of this Objective.
Topics are only counted once towards the total number of topics for this Objective.

Chapter 7 - Systems of Equations and Matrices / Additional Topics (7 topics, no due date)

Section 7.1 (6 topics)

- Solving a system of linear equations using substitution
- Solving a system of linear equations using elimination with multiplication and addition
- Solving a 2x2 system of linear equations that is inconsistent or consistent dependent
- Solving a word problem involving a sum and another basic relationship using a system of linear equations
- Solving a value mixture problem using a system of linear equations
- Solving a distance, rate, time problem using a system of linear equations

Chapter 7 Supplementary Topics (1 topic)

- Classifying systems of linear equations from graphs