

# ALEKS®

## Florida Math 0028

### Correlation of the ALEKS course Florida Math 0028 to the Florida Mathematics Competencies - Upper

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#### Exponents & Polynomials

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- = ALEKS course topic that addresses the standard

#### **MDECU1: Applies the order of operations to evaluate algebraic expressions, including those with parentheses and exponents**

- Order of operations with whole numbers
- Order of operations with whole numbers and grouping symbols
- Order of operations with whole numbers and exponents: Basic
- Order of operations with whole numbers and exponents: Advanced
- Evaluating an algebraic expression: Whole number operations and exponents
- Absolute value of a number
- Operations with absolute value
- Exponents and integers: Problem type 1
- Exponents and integers: Problem type 2
- Exponents and signed fractions
- Order of operations with integers and exponents
- Evaluating a linear expression: Integer multiplication with addition or subtraction
- Evaluating a quadratic expression: Integers
- Evaluating a linear expression: Signed fraction multiplication with addition or subtraction
- Evaluating a linear expression: Signed decimal addition and subtraction
- Evaluating a linear expression: Signed decimal multiplication with addition or subtraction
- Combining like terms: Whole number coefficients
- Combining like terms: Integer coefficients
- Multiplying a constant and a linear monomial
- Distributive property: Whole number coefficients
- Distributive property: Integer coefficients
- Using distribution and combining like terms to simplify: Univariate
- Using distribution with double negation and combining like terms to simplify: Multivariate
- Combining like terms in a quadratic expression

#### **MDECU2: Simplifies an expression with integer exponents**

- Understanding the product rule of exponents
- Introduction to the product rule of exponents
- Product rule with positive exponents: Univariate
- Product rule with positive exponents: Multivariate
- Understanding the power rules of exponents

- 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
- Simplifying a ratio of multivariate monomials: Basic
- Introduction to the quotient rule of exponents
- Simplifying a ratio of univariate monomials
- Quotient of expressions involving exponents
- Simplifying a ratio of multivariate monomials: Advanced
- Power and quotient rules with positive exponents
- Evaluating expressions with exponents of zero
- Evaluating an expression with a negative exponent: Whole number base
- Evaluating an expression with a negative exponent: Positive fraction base
- Evaluating an expression with a negative exponent: Negative integer base
- Rewriting an algebraic expression without a negative exponent
- Introduction to the product rule with negative exponents
- Product rule with negative exponents
- Quotient rule with negative exponents: Problem type 1
- Quotient rule with negative exponents: Problem type 2
- Power of a power rule with negative exponents
- Power rules with negative exponents
- Power and quotient rules with negative exponents: Problem type 1
- Power and quotient rules with negative exponents: Problem type 2
- Power, product, and quotient rules with negative exponents

**MDECU3: Add, subtract, multiply, and divide polynomials. Division by monomials only.**

- Simplifying a sum or difference of two univariate polynomials
- Simplifying a sum or difference of three univariate polynomials
- Simplifying a sum or difference of multivariate polynomials
- Multiplying a univariate polynomial by a monomial with a positive coefficient
- Multiplying a univariate polynomial by a monomial with a negative coefficient
- Multiplying a multivariate polynomial by a monomial
- Multiplying binomials with leading coefficients of 1
- Multiplying binomials with leading coefficients greater than 1
- Multiplying binomials in two variables
- Multiplying conjugate binomials: Univariate
- Multiplying conjugate binomials: Multivariate
- Squaring a binomial: Univariate
- Squaring a binomial: Multivariate
- Multiplying binomials with negative coefficients
- Multiplication involving binomials and trinomials in one variable
- Multiplication involving binomials and trinomials in two variables
- Dividing a polynomial by a monomial: Univariate

- Dividing a polynomial by a monomial: Multivariate

### **MDECU11: Convert between scientific notation and standard notation**

- Scientific notation with positive exponent
- Scientific notation with negative exponent
- Converting between scientific notation and standard form in a real-world situation
- Multiplying numbers written in scientific notation: Basic
- Multiplying numbers written in scientific notation: Advanced
- Dividing numbers written in scientific notation: Basic
- Dividing numbers written in scientific notation: Advanced

### **MDECU12: Solve application problems involving geometry (perimeter and area with algebraic expressions)**

- Finding the side length of a rectangle given its perimeter or area
- Finding a side length given the perimeter and side lengths with variables
- Finding the perimeter or area of a rectangle given one of these values
- Solving a word problem using a quadratic equation with rational roots
- Using the Pythagorean Theorem and a quadratic equation to find side lengths of a right triangle

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## **Factoring**

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### **MDECU4: Solve quadratic equations in one variable by factoring**

- Finding the roots of a quadratic equation of the form  $ax^2 + bx = 0$
- 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 quadratic equation needing simplification

### **MDECU5: Factor polynomial expressions (GCF, grouping, trinomials, difference of squares)**

- Factoring a linear binomial
- Introduction to the GCF of two monomials
- Greatest common factor of three univariate monomials
- Greatest common factor of two multivariate monomials
- Factoring out a monomial from a polynomial: Univariate
- Factoring out a monomial from a polynomial: Multivariate
- Factoring out a binomial from a polynomial: Basic
- 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 multivariate polynomial by grouping: Problem type 2
- Factoring a quadratic with leading coefficient 1

- Factoring a quadratic in two variables with leading coefficient 1
- Factoring out a constant before factoring a quadratic
- 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 with leading coefficient greater than 1: Problem type 3
- Factoring a quadratic by the ac-method
- Factoring a quadratic in two variables with leading coefficient greater than 1
- Factoring a quadratic with a negative leading coefficient
- Factoring a perfect square trinomial with leading coefficient 1
- Factoring a perfect square trinomial with leading coefficient greater than 1
- Factoring a perfect square trinomial in two variables
- 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 polynomial involving a GCF and a difference of squares: Univariate
- Factoring a polynomial involving a GCF and a difference of squares: Multivariate
- Factoring a product of a quadratic trinomial and a monomial
- Factoring with repeated use of the difference of squares formula

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## Graphing

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### **MDECU6: Graph linear equations using tables of values, intercepts, slope intercept form**

- 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
- Graphing a line given its x- and y-intercepts
- Graphing a line by first finding its x- and y-intercepts
- Graphing a line given its slope and y-intercept
- Graphing a line through a given point with a given slope
- Graphing a line by first finding its slope and y-intercept

### **MDECU13: Identifies the intercepts of a linear equation**

- Finding x- and y-intercepts given the graph of a line on a grid
- Finding x- and y-intercepts of a line given the equation: Basic
- Finding x- and y-intercepts of a line given the equation: Advanced
- Graphing a line given its x- and y-intercepts
- Graphing a line by first finding its x- and y-intercepts

### **MDECU14: Identify the slope of a line (from slope formula, graph, and equation)**

- Classifying slopes given graphs of lines
- 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
- Finding the slope and y-intercept of a line given its equation in the form  $y = mx + b$
- Finding the slope and y-intercept of a line given its equation in the form  $Ax + By = C$
- Graphing a line by first finding its slope and y-intercept

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## Linear Equations

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### **MDECU7: Solve linear equations in one variable using manipulations guided by the rules of arithmetic and the properties of equality**

- Additive property of equality with whole numbers
- Additive property of equality with decimals
- Additive property of equality with integers
- Additive property of equality with signed fractions
- Multiplicative property of equality with whole numbers
- Multiplicative property of equality with fractions
- Multiplicative property of equality with decimals
- Multiplicative property of equality with integers
- Multiplicative property of equality with signed fractions
- Using two steps to solve an equation with whole numbers
- Additive property of equality with a negative coefficient
- Solving a two-step equation with integers
- Introduction to solving an equation with parentheses
- Solving a multi-step equation given in fractional form
- Solving a two-step equation with signed decimals
- Introduction to solving a linear equation with several occurrences of the variable
- Solving a linear equation with several occurrences of the variable: Variables on the same side
- Solving a linear equation with several occurrences of the variable: Variables on both sides
- Solving a linear equation with several occurrences of the variable: Variables on the same side and distribution
- Solving a linear equation with several occurrences of the variable: Variables on both sides and distribution
- Solving a linear equation with several occurrences of the variable: Variables on both sides and two distributions
- Solving a linear equation with several occurrences of the variable: Fractional forms with monomial numerators
- Solving a two-step equation with signed fractions
- Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
- Solving a linear equation with several occurrences of the variable: Fractional forms with

binomial numerators

- Solving equations with zero, one, or infinitely many solutions

**MDECU8: Solve literal equations for a given variable with applications (geometry, motion [ $d=rt$ ], simple interest [ $i=prt$ ])**

- Solving for a variable in terms of other variables using addition or subtraction: Basic
- Solving for a variable in terms of other variables using addition or subtraction: Advanced
- Solving for a variable in terms of other variables using multiplication or division: Basic
- 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

**MDECU15: Solve multi-step problems involving fractions and percentages (Include situations such as simple interest, tax, markups/markdowns, gratuities and commissions, fees, percent increase or decrease, percent error, expressing rent as a percentage of take home pay)**

- Translating a phrase into a two-step expression
- Translating a sentence into a one-step equation
- Translating a sentence into a multi-step equation
- Solving a fraction word problem using a linear equation of the form  $Ax = B$
- Solving a fraction word problem using a linear equation with the variable on both sides
- Applying the percent equation: Problem type 1
- Applying the percent equation: Problem type 2
- Writing a ratio as a percentage without a calculator
- Computing a percentage from a table of values
- Finding the rate of a tax or commission
- Finding the total amount given the percentage of a partial amount
- Finding the multiplier to give a final amount after a percentage increase or decrease
- Finding the final amount given the original amount and a percentage increase or decrease
- Finding the sale price given the original price and percent discount
- Finding the sale price without a calculator given the original price and percent discount
- Finding the total cost including tax or markup
- Finding the original amount given the result of a percentage increase or decrease
- Finding the original price given the sale price and percent discount
- Finding the percentage increase or decrease: Basic
- Finding the percentage increase or decrease: Advanced
- Computations from a circle graph
- Finding simple interest without a calculator

**MDECU16: Solve linear inequalities in one variable and graph the solution set on a number line**

- Translating a sentence into a one-step inequality
- Writing a one-step inequality for a real-world situation
- Graphing a linear inequality on the number line
- Identifying solutions to a linear inequality in one variable

- Additive property of inequality with whole numbers
- Additive property of inequality with integers
- Additive property of inequality with signed fractions
- Additive property of inequality with signed decimals
- Multiplicative property of inequality with integers
- Multiplicative property of inequality with signed fractions
- Solving a two-step linear inequality: Problem type 1
- Solving a two-step linear inequality: Problem type 2
- Solving a two-step linear inequality with a fractional coefficient
- Solving a linear inequality with multiple occurrences of the variable: Problem type 1
- Solving a linear inequality with multiple occurrences of the variable: Problem type 2
- Solving a linear inequality with multiple occurrences of the variable: Problem type 3
- Word problem with linear inequalities: Problem type 1

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## Radicals

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### **MDECU9: Simplify radical expressions - square roots only**

- Square root of a perfect square
- Using a calculator to approximate a square root
- Finding all square roots of a number
- Square root of a rational perfect square
- Square roots of perfect squares with signs
- Introduction to simplifying a radical expression with an even exponent
- Square root of a perfect square monomial
- Simplifying the square root of a whole number less than 100
- Simplifying the square root of a whole number greater than 100
- Simplifying a radical expression with an even exponent
- Introduction to simplifying a radical expression with an odd exponent
- Simplifying a radical expression with an odd exponent
- Simplifying a radical expression with two variables

### **MDECU10: Adds, subtracts, and multiplies square roots of monomials**

- Introduction to square root addition or subtraction
- Square root addition or subtraction
- Square root addition or subtraction with three terms
- Introduction to simplifying a sum or difference of radical expressions: Univariate
- Simplifying a sum or difference of radical expressions: Univariate
- Simplifying a sum or difference of radical expressions: Multivariate
- Introduction to square root multiplication
- Square root multiplication: Basic
- Square root multiplication: Advanced
- Introduction to simplifying a product of radical expressions: Univariate

- Simplifying a product of radical expressions: Univariate
- Simplifying a product of radical expressions: Multivariate
- Introduction to simplifying a product involving square roots using the distributive property
- Simplifying a product involving square roots using the distributive property: Basic

### **MDECU17: Rationalize the denominator (monomials only)**

- Simplifying a quotient of square roots
- Rationalizing a denominator: Quotient involving square roots
- Rationalizing a denominator: Square root of a fraction
- Rationalizing a denominator: Quotient involving a monomial

### **MDECU18: Solve application problems involving geometry (Pythagorean Theorem)**

- Introduction to the Pythagorean Theorem
- Pythagorean Theorem
- Word problem involving the Pythagorean Theorem

## **Rationals**

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### **MDECU19: Recognize proportional relationships and solve problems involving rates and ratios**

- Solving a word problem on proportions using a unit rate
- Solving a proportion of the form  $x/a = b/c$
- Solving a proportion of the form  $(x+a)/b = c/d$
- Solving a one-step word problem using the formula  $d = rt$
- Solving a word problem involving rates and time conversion
- Solving a proportion of the form  $a/(x+b) = c/x$
- Finding a unit price
- Computing unit prices to find the better buy
- Finding unit rates
- Word problem on proportions: Problem type 1
- Word problem on proportions: Problem type 2
- Similar polygons
- Indirect measurement
- Word problem involving multiple rates

### **MDECU20: Simplify, multiply, and divide rational expressions**

- Simplifying a ratio of factored polynomials: Linear factors
- Simplifying a ratio of factored polynomials: Factors with exponents
- Simplifying a ratio of polynomials using GCF factoring
- Simplifying a ratio of linear polynomials: 1, -1, and no simplification
- Simplifying a ratio of polynomials by factoring a quadratic with leading coefficient 1
- Simplifying a ratio of polynomials: Problem type 1

- Simplifying a ratio of polynomials: Problem type 2
- Simplifying a ratio of polynomials: Problem type 3
- Simplifying a ratio of multivariate polynomials
- Multiplying rational expressions involving multivariate monomials
- Multiplying rational expressions made up of linear expressions
- Multiplying rational expressions involving quadratics with leading coefficients of 1
- Multiplying rational expressions involving quadratics with leading coefficients greater than 1
- Dividing rational expressions involving multivariate monomials
- Dividing rational expressions involving linear expressions
- Dividing rational expressions involving quadratics with leading coefficients of 1
- Dividing rational expressions involving quadratics with leading coefficients greater than 1
- Complex fraction without variables: Problem type 1
- Complex fraction involving univariate monomials
- Complex fraction involving multivariate monomials

### **MDECU21: Add and subtract rational expressions with monomial denominators**

- Writing equivalent rational expressions with monomial denominators
- Introduction to adding fractions with variables and common denominators
- Adding rational expressions with common denominators and monomial numerators
- Adding rational expressions with common denominators and binomial numerators
- Adding rational expressions with different denominators and a single occurrence of a variable
- Adding rational expressions with denominators  $ax$  and  $bx$ : Basic
- Adding rational expressions with denominators  $ax$  and  $bx$ : Advanced
- Adding rational expressions with denominators  $ax^n$  and  $bx^m$
- Adding rational expressions with multivariate monomial denominators: Basic
- Adding rational expressions with multivariate monomial denominators: Advanced

### **MDECU22: Convert units of measurements across measurement systems**

- Converting between temperatures in Fahrenheit and Celsius
- Converting between metric and U.S. Customary unit systems
- Converting between compound units: Basic
- Converting between compound units: Advanced