DesCartes: A Continuum of Learning®

Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range: 251 - 260
Statements Last Updated: Mar 10, 2014

Skills and Concepts to Enhance (73% Probability*) 241 - 250	Skills and Concepts to Develop (50% Probability*) 251 - 260	Skills and Concepts to Introduce (27% Probability*) 261 - 270
Expressions and Equations	Expressions and Equations	Expressions and Equations
• Evaluates expressions using the order of operations, including exponents (whole numbers only)	• Simplifies rational expressions with exponents	• Simplifies rational expressions with exponents
• Solves real-world problems involving rate of pay with time and a half	• Solves problems with scientific notation	• Simplifies rational expressions with negative exponents
• Evaluates numerical expressions using the order of operations (using integers)	• Describes and uses a variable with whole numbers, multiplication, and division in a contextual situation	• Estimates the limit of a given infinite sequence (e.g., given the sequence 1/n, as n gets larger)
• Evaluates expressions using the order of operations, including exponents (using integers)	• Uses expressions to represent situations that involve variable quantities with exponents	• Uses the compound interest equation to solve problems
• Solves problems involving simple interest rates without the formula	• Evaluates expressions by substituting with rational numbers	• Simplifies monomials
• Simplifies rational expressions with scientific notation	• Simplifies monomials	• Simplifies polynomial expressions using power laws
• Solves problems with scientific notation	• Simplifies polynomial expressions	• Factors polynomials by identifying a common monomial and then factoring the trinomial
• Describes and uses a variable with whole numbers, multiplication, and division in a contextual situation	• Simplifies algebraic expressions with integer exponents	• Rewrites a complex formula to solve for a specific variable
• Uses expressions to represent situations that involve variable quantities with exponents	• Multiplies binomials	• Solves quadratic equations using the quadratic formula
• Evaluates expressions by substituting with rational numbers	• Multiplies a polynomial by a polynomial	• Solves quadratic equations by completing the square
• Simplifies polynomial expressions	• Divides a polynomial by a monomial	• Solves real-world systems of linear equations
• Multiplies binomials	• Factors polynomials by identifying common factors	• Solves polynomial inequalities
• Factors trinomials in the form x^2 + bx + c	• Factors trinomials in the form x^2 + bx + c	• Uses graphs to solve systems of linear inequalities
• Factors polynomials using difference of squares	• Factors polynomials using difference of squares	
• Uses basic operations on algebraic expressions (uses correct order of operations)	• Writes equivalent forms of algebraic equations using multiplication and division	
• Uses linear equations to represent situations involving variable quantities	• Solves linear equations using rational numbers	
• Solves 2-step open sentences with missing factors (variables on both sides of the sentence)	• Applies algebraic methods to solve complex real-world and theoretical problems	
• Solves linear equations with fractions	• Rewrites a complex formula to solve for a specific variable	
• Solves linear equations using rational numbers	• Identifies discriminants and roots	
• Solves open sentences with fractions	• Solves quadratic equations by factoring	
• Applies algebraic methods to solve real-world problems	• Solves quadratic equations by completing the square	
• Applies algebraic methods to solve a variety of real-world and theoretical problems	• Solves polynomial equations (e.g., ax = b + cx, a(x + b) = c, ax + b = cx + d, a(bx + c) = d(ex + f), a/x = b)	
• Solves problems involving consecutive numbers	• Uses polynomial equations to solve area and perimeter problems	
• Uses polynomial equations to solve complex real-world problems (e.g., using distributive property, variables on both sides)	• Solves polynomial equations with integers as exponents	
• Uses algebraic methods to solve systems of linear equations	• Uses the Multiplication Property of Equality as a first step in solving systems of linear equations	
• Solves simple one-step inequality open sentences	• Uses substitution as a first step in solving systems of linear equations	
• Solves single variable linear inequalities with the variable in only one member using number lines	• Uses algebraic methods to solve systems of linear equations	
• Describes the relationship or a real-world situation represented by a simple linear inequality (e.g., 1- or 2-step)	• Uses graphs to solve systems of linear equations	
	• Solves real-world systems of linear equations	
	• Solves single variable linear inequalities with the variable in only one member using number lines	
	• Solves single variable linear inequalities with variable in both members using number lines	

Explanatory Notes

* At the range mid-point, this is the probability students would correctly answer items measuring these concepts and skills. Both data from test items and review by NWEA curriculum specialists are used to place Learning Continuum statements into appropriate RIT ranges. Blank cells indicate data are limited or unavailable for this range or document version.

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Expressions and Equations	**Expressions and Equations**	**Expressions and Equations**
• Solves linear inequalities using graphs • Solves complex real-world problems involving capacity • Solves problems involving capacity in the metric system and converts to larger or smaller units • Converts from Celsius to Fahrenheit, given conversion ratios • Uses reasoning strategies to solve problems • Determines the prime factorization of a number using powers • Writes a whole number in scientific notation • Writes a decimal in scientific notation	• Uses graphs to solve systems of linear inequalities • Determines the length of the side of a square, given the area • Uses reasoning strategies to solve problems • Uses fractional and negative exponents as optional ways of representing problem situations (e.g., 27^2/3 = (27^1/3)^2 = 9)	
Use Functions to Model Relationships	**Use Functions to Model Relationships**	**Use Functions to Model Relationships**
• Represents growing arithmetic patterns using algebraic expressions or equations • Writes linear equations when given ordered pairs • Writes the equation of a horizontal or vertical line when given the graph of the line • Determines x- or y-intercept of a given linear equation • Identifies and describes situations with varying rates of change • Solves quadratic equations using concrete models and tables • Uses tables to determine function equations • Represents a real-world function using a complex equation (e.g., variables on both sides, distributive, rational) • Models real life functions using function notation • Determines the minimum and maximum of a quadratic function • Analyzes the properties and characteristics of exponential functions • Determines the x- and/or y-intercept of an equation of a function • Performs operations on functions • Solves problems involving complex functions • Determines the domain and range of a function	• Uses an algebraic expression to represent a triangular number pattern • Rewrites an equation for a line in standard form • Determines x- or y-intercept of a given linear equation • Writes the equation of the line when given the graph of the line • Determines the graph of a line when given the equation • Writes linear equations, given two points on a line • Determines slope from graphs • Determines slope from ordered pairs and tables • Identifies and describes situations with varying rates of change • Represents a real-world function using a complex equation (e.g., variables on both sides, distributive, rational) • Models real life functions using function notation • Distinguishes between linear and nonlinear functions (analysis) • Uses graphs to represent functions and interpret slope • Identifies the equation of a parabola • Determines the vertex of a parabola • Determines the minimum and maximum of a quadratic function • Analyzes the properties and characteristics of exponential functions • Investigates, describes, and predicts the effects of parameter changes on the graphs of exponential functions • Determines the effects of parameter changes on functions • Determines the domain and range of a function	• Writes the equation of the line when given the graph of the line • Writes linear equations, given slope and point on a line • Models real life functions using function notation • Determines the minimum and maximum of a quadratic function • Analyzes the properties and characteristics of exponential functions
New Vocabulary: polynomial, solution set, y-intercept	*New Vocabulary:* coordinate plane, quadratic equation, undefined, wider, x-coordinate, y-coordinate	*New Vocabulary:* geometric series, semi-annual
New Signs and Symbols: % percent	*New Signs and Symbols:* [ ] square brackets, { } set notation, P perimeter	*New Signs and Symbols:* P principal, r rate, t time

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