

Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range: < 161 Statements Last Updated: Aug 4, 2014

Skills and Concepts to Develop (50% Probability*) < 161	Skills and Concepts to Introduce (27% Probability*) 161 - 170	
Use Functions to Model Relationships	Use Functions to Model Relationships	
New Vocabulary: None	New Vocabulary: None	
New Signs and Symbols: None	New Signs and Symbols: + addition, = is equal to, - subtraction, variable	

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range: 161 - 170 Statements Last Updated: Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) < 161	Skills and Concepts to Develop (50% Probability*) 161 - 170	Skills and Concepts to Introduce (27% Probability*) 171 - 180
Expressions and Equations	Expressions and Equations	Expressions and Equations
	Solves basic-facts open sentences - addition and subtraction	 Represents a basic facts addition problem with a number sentence
		 Solves basic-facts open sentences - addition and subtraction
		Solves linear equations with basic facts - 1-step addition using a letter for the variable
		 Solves basic facts open sentences - multiplication and division
		Writes a number sentence for a simple problem solving situation
		• Writes equivalent forms of whole number expressions (e.g., 15 + 5 = 10 + 10)
Use Functions to Model Relationships	Use Functions to Model Relationships	Use Functions to Model Relationships
		 Extends a growing arithmetic pattern, defined by numbers Analyzes a growing, arithmetic pattern with numbers to determine the rule
New Vocabulary: None	New Vocabulary: None	New Vocabulary: None
New Signs and Symbols: None	New Signs and Symbols: + addition, = is equal to, - subtraction, variable	New Signs and Symbols: None

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range: 171 - 180 Statements Last Updated: Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 161 - 170	Skills and Concepts to Develop (50% Probability*) 171 - 180	Skills and Concepts to Introduce (27% Probability*) 181 - 190
Expressions and Equations	Expressions and Equations	Expressions and Equations
Solves basic-facts open sentences - addition and subtraction	 Represents a basic facts addition problem with a number sentence Solves basic-facts open sentences - addition and subtraction Solves linear equations with basic facts - 1-step addition using a letter for the variable Solves basic facts open sentences - multiplication and division Writes a number sentence for a simple problem solving situation Writes equivalent forms of whole number expressions (e.g., 15 + 5 = 10 + 10) 	 Solves real-world whole number problems involving subtraction with numbers under 1000 Demonstrates an understanding of the zero property of multiplication Solves basic facts addition and subtraction open sentences using diagrams and models (e.g., using balances) Solves linear equations with basic facts - 1-step addition using a letter for the variable Solves 1-step open sentences with missing addends (numbers 100 and under) Writes a number sentence for a simple problem solving situation Writes equivalent forms of whole numbers 11 to 20 using addition (e.g., 14 = 7 + 7)
Use Functions to Model Relationships	Use Functions to Model Relationships	Use Functions to Model Relationships
	 Extends a growing arithmetic pattern, defined by numbers Analyzes a growing, arithmetic pattern with numbers to determine the rule 	 Extends a growing arithmetic pattern, defined by numbers Analyzes a growing, arithmetic pattern with numbers to determine the rule Identifies transformations of plane figures (translations/slides) Reads data in a line graph - no calculations
New Vocabulary: None	New Vocabulary: None	New Vocabulary: None
New Signs and Symbols: + addition, = is equal to, - subtraction, variable	New Signs and Symbols: None	New Signs and Symbols: × multiplication

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range:	181 - 190
Statements Last Updated:	Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 171 - 180	Skills and Concepts to Develop (50% Probability*) 181 - 190	Skills and Concepts to Introduce (27% Probability*) 191 - 200
Expressions and Equations	Expressions and Equations	Expressions and Equations
 Represents a basic facts addition problem with a number sentence Solves basic-facts open sentences - addition and subtraction 	Solves real-world whole number problems involving subtraction with numbers under 1000	Solves real-world whole number problems involving subtraction with numbers under 1000
 Solves linear equations with basic facts - 1-step addition using a letter for the variable Solves basic facts open sentences - multiplication and division Writes a number sentence for a simple problem solving situation Writes equivalent forms of whole number expressions (e.g., 15 + 5 = 10 + 10) 	 Demonstrates an understanding of the zero property of multiplication Solves basic facts addition and subtraction open sentences using diagrams and models (e.g., using balances) Solves linear equations with basic facts - 1-step addition using a letter for the variable Solves 1-step open sentences with missing addends (numbers 100 and under) Writes a number sentence for a simple problem solving situation Writes equivalent forms of whole numbers 11 to 20 using addition (e.g., 14 = 7 + 7) 	 Solves whole number subtraction word problems with numbers over 1000 Evaluates numerical expressions using grouping symbols (whole numbers only) Demonstrates an understanding of the zero property of multiplication Computes half price (multiplication/division) Uses algebraic reasoning to solve problems involving equality relationships Solves 1-step open sentences with missing addends (numbers 100 and under) Solves simple open sentences with missing factors (numbers 100 and under) Solves 2-step open sentences with missing addends Writes equivalent forms of whole numbers 11 to 20 using addition
		(e.g., $14 = 7 + 7$)
Use Functions to Model Relationships	Use Functions to Model Relationships	Use Functions to Model Relationships
 Extends a growing arithmetic pattern, defined by numbers 	• Extends a growing arithmetic pattern, defined by numbers	• Extends a growing arithmetic pattern, defined by objects or diagrams
 Analyzes a growing, arithmetic pattern with numbers to determine the rule 	Analyzes a growing, arithmetic pattern with numbers to determine the rule	Analyzes a growing, arithmetic pattern with numbers to determine the rule
	 Identifies transformations of plane figures (translations/slides) Reads data in a line graph - no calculations 	• Completes a simple function table based on real-life situations (e.g., the number of tricycles related to the number of wheels)
		 Reads data in a line graph - no calculations
New Vocabulary: None	New Vocabulary: None	New Vocabulary: longer
New Signs and Symbols: None	New Signs and Symbols: x multiplication	New Signs and Symbols: () order of operations, ÷ division, \$ dollar sign

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

Skills and Concepts to Enhance (73% Probability*) 181 - 190	Skills and Concepts to Develop (50% Probability*) 191 - 200	Skills and Concepts to Introduce (27% Probability*) 201 - 210
Expressions and Equations	Expressions and Equations	Expressions and Equations
 Solves real-world whole number problems involving subtraction with numbers under 1000 	Solves real-world whole number problems involving subtraction with numbers under 1000	 Uses rounding to estimate answers to 2-step problems involving money (using decimals)
 Demonstrates an understanding of the zero property of multiplication Solves basic facts addition and subtraction open sentences using 	Solves whole number subtraction word problems with numbers over 1000	Solves whole number subtraction word problems with numbers over 1000
 diagrams and models (e.g., using balances) Solves linear equations with basic facts - 1-step addition using a letter 	 Evaluates numerical expressions using grouping symbols (whole numbers only) 	 Evaluates numerical expressions using grouping symbols (whole numbers only)
 For the variable Solves 1-step open sentences with missing addends (numbers 100 	 Demonstrates an understanding of the zero property of multiplication Computes half price (multiplication/division) 	Demonstrates an understanding of the commutative property of addition
 Writes a number sentence for a simple problem solving situation 	Uses algebraic reasoning to solve problems involving equality relationships	• Understands equivalence and extends the concept to number sentences involving variables (e.g., 8 + 2 = [] + 2)
• Writes equivalent forms of whole numbers 11 to 20 using addition (e.g., 14 = 7 + 7)	Solves 1-step open sentences with missing addends (numbers 100 and under)	Uses algebraic reasoning to solve problems involving equality relationships
(Solves 1-step open sentences with missing addends (numbers over	Uses simple linear equations to represent problem situations
	100)Solves simple open sentences with missing factors (numbers 100 and	Describes a realistic situation using information given in a linear equation
	under)	Solves 1-step open sentences with missing addends (numbers over
	 Solves 2-step open sentences with missing addends 	100)
	• Writes equivalent forms of whole numbers 11 to 20 using addition (e.g., 14 = 7 + 7)	Solves simple open sentences with missing factors (numbers 100 and under)
		 Solves 2-step open sentences with missing addends
		• Solves open sentences with basic-facts calculations on both sides of the sentence
		Translates a 2-step problem to a symbolic expression or equation
		 Solves real-world problems using reasoning strategies
Use Functions to Model Relationships	Use Functions to Model Relationships	Use Functions to Model Relationships
 Extends a growing arithmetic pattern, defined by numbers 	• Extends a growing arithmetic pattern, defined by objects or diagrams	• Extends a growing arithmetic pattern, defined by objects or diagrams
 Analyzes a growing, arithmetic pattern with numbers to determine the rule 	Analyzes a growing, arithmetic pattern with numbers to determine the rule	• Completes a simple function table based on real-life situations (e.g., the number of tricycles related to the number of wheels)
 Identifies transformations of plane figures (translations/slides) 	Completes a simple function table based on real-life situations (e.g.,	 Completes a function table given a simple rule (e.g., x + 2)
 Reads data in a line graph - no calculations 	the number of tricycles related to the number of wheels)	Predicts from simple charts and tables
	Reads data in a line graph - no calculations	
New Vocabulary: None	New Vocabulary: longer	New Vocabulary: minimum, plus
New Signs and Symbols: × multiplication	New Signs and Symbols: () order of operations, \div division, \$ dollar sign	<i>New Signs and Symbols:</i> °C degrees Celsius, = is equal to, min minute, - negative number, p.m., + positive number

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.

© 2006-2014 Northwest Evaluation Association. All rights reserved. Please refer to the DesCartes Use Agreement for terms of use. Educational Standard: Common Core Mathematics K-12: 2010



Mathematics

Goal: Operations and Algebraic Thinking

Skills and Concepts to Enhance (73% Probability*) 191 - 200	Skills and Concepts to Develop (50% Probability*) 201 - 210	Skills and Concepts to Introduce (27% Probability*) 211 - 220
Expressions and Equations	Expressions and Equations	Expressions and Equations
 Solves real-world whole number problems involving subtraction with numbers under 1000 	Uses rounding to estimate answers to 2-step problems involving money (using decimals)	 Uses rounding to estimate answers to 2-step problems involving money (using decimals)
 Solves whole number subtraction word problems with numbers over 1000 	Solves whole number subtraction word problems with numbers over 1000	Demonstrates an understanding of the associative property of multiplication
 Evaluates numerical expressions using grouping symbols (whole numbers only) 	• Evaluates numerical expressions using grouping symbols (whole numbers only)	 Demonstrates an understanding of the distributive property of multiplication by decomposing a term
Demonstrates an understanding of the zero property of multiplication	Demonstrates an understanding of the commutative property of	• Calculates the value of a power (e.g., 2 ³ = 8)
 Computes half price (multiplication/division) 	addition	Uses a table of input/output values to represent patterns
 Uses algebraic reasoning to solve problems involving equality relationships 	• Understands equivalence and extends the concept to number sentences involving variables (e.g., 8 + 2 = [] + 2)	• Understands equivalence and extends the concept to number sentences involving variables (e.g., 8 + 2 = [] + 2)
 Solves 1-step open sentences with missing addends (numbers 100 and under) 	Uses algebraic reasoning to solve problems involving equality relationships	 Uses algebraic reasoning to solve problems involving equality relationships
Solves 1-step open sentences with missing addends (numbers over	Uses simple linear equations to represent problem situations	Uses simple linear equations to represent problem situations
100)	Describes a realistic situation using information given in a linear	• Solves simple open sentences with missing factors (numbers over 100)
Solves simple open sentences with missing factors (numbers 100 and	equation	Solves open sentences using the distributive property
under)	Solves 1-step open sentences with missing addends (numbers over 100)	Solves open sentences with calculations on both sides of the sentence
Solves 2-step open sentences with missing addends	Solves simple open sentences with missing factors (numbers 100 and	Solves 2-step open sentences with missing factors
• Writes equivalent forms of whole numbers 11 to 20 using addition (e.g., 14 = 7 + 7)	under)	Solves 1-step linear equations
(0.9., 11 – 111)	Solves 2-step open sentences with missing addends	Applies algebraic methods to solve theoretical problems
	Solves open sentences with basic-facts calculations on both sides of	Translates a 2-step problem to a symbolic expression or equation
	the sentence	Solves real-world problems using reasoning strategies
	Translates a 2-step problem to a symbolic expression or equation	• Uses powers to represent 10, 100, 1000, 10,000, and 100,000
	Solves real-world problems using reasoning strategies	
Use Functions to Model Relationships	Use Functions to Model Relationships	Use Functions to Model Relationships
 Extends a growing arithmetic pattern, defined by objects or diagrams 	• Extends a growing arithmetic pattern, defined by objects or diagrams	 Completes a function table given a simple rule (e.g., x + 2)
Analyzes a growing, arithmetic pattern with numbers to determine the	• Completes a simple function table based on real-life situations (e.g.,	 Solves problems involving simple functions
rule	the number of tricycles related to the number of wheels)	 Looks for a growing pattern to solve a problem
 Completes a simple function table based on real-life situations (e.g., the number of tricycles related to the number of wheels) 	• Completes a function table given a simple rule (e.g., x + 2)	 Interprets data in line graphs (e.g., change over time)
Reads data in a line graph - no calculations	Predicts from simple charts and tables	
New Vocabulary: longer	New Vocabulary: minimum, plus	New Vocabulary: None
New Signs and Symbols: () order of operations, ÷ division, \$ dollar sign	<i>New Signs and Symbols:</i> °C degrees Celsius, = is equal to, min minute, - negative number, p.m., + positive number	New Signs and Symbols: () parenthesis around an integer, a.m., ¢ cent sign, °F degrees Fahrenheit, \$ dollar sign, lb pound, mph miles per hour

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.

© 2006-2014 Northwest Evaluation Association. All rights reserved. Please refer to the DesCartes Use Agreement for terms of use. Educational Standard: Common Core Mathematics K-12: 2010



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range:211 - 220Statements Last Updated:Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 201 - 210	Skills and Concepts to Develop (50% Probability*) 211 - 220	Skills and Concepts to Introduce (27% Probability*) 221 - 230
Expressions and Equations	Expressions and Equations	Expressions and Equations
 Uses rounding to estimate answers to 2-step problems involving money (using decimals) 	 Uses rounding to estimate answers to 2-step problems involving money (using decimals) 	 Solves real-world problems involving rate of pay Solves difficult real-world problems involving decimals (e.g., multiple
 Solves whole number subtraction word problems with numbers over 1000 	Demonstrates an understanding of the associative property of multiplication	 multiplications, conversions) Uses the distributive property
 Evaluates numerical expressions using grouping symbols (whole numbers only) 	 Demonstrates an understanding of the distributive property of multiplication by decomposing a term 	• Calculates the value of a power (e.g., 2^3 = 8)
Demonstrates an understanding of the commutative property of addition	 Calculates the value of a power (e.g., 2³ = 8) Uses a table of input/output values to represent patterns 	Solves problems involving simple interest rates with the formulaUses a table of input/output values to represent patterns
 Understands equivalence and extends the concept to number sentences involving variables (e.g., 8 + 2 = [] + 2) 	 Understands equivalence and extends the concept to number sentences involving variables (e.g., 8 + 2 = [] + 2) 	 Uses basic operations on algebraic expressions (substituting for unknowns)
 Uses algebraic reasoning to solve problems involving equality relationships 	Uses algebraic reasoning to solve problems involving equality relationships	Recognizes commutative, associative, distributive, symmetric, transitive, and reflexive properties
 Uses simple linear equations to represent problem situations Describes a realistic situation using information given in a linear 	Uses simple linear equations to represent problem situations	Uses basic operations on algebraic expressions (expanding - monomial by a binomial)
 equation Solves 1-step open sentences with missing addends (numbers over 	 Solves simple open sentences with missing factors (numbers over 100) Solves open sentences using the distributive property 	• Demonstrates an understanding of properties (e.g., commutative, associative, distributive, properties of 0)
 100) Solves simple open sentences with missing factors (numbers 100 and 	 Solves open sentences with calculations on both sides of the sentence Solves 2-step open sentences with missing factors 	• Writes equivalent forms of algebraic expressions (e.g., $(x + 3)/2 = x/2 + 3/2$)
under)	Solves 1-step linear equations	Represents relationships of quantities in the form of an expression
 Solves 2-step open sentences with missing addends 	Applies algebraic methods to solve theoretical problems	Uses basic operations on algebraic expressions (uses correct order of operations)
 Solves open sentences with basic-facts calculations on both sides of the sentence 	Translates a 2-step problem to a symbolic expression or equation	Expresses a simple linear equation from a contextual situation
Translates a 2-step problem to a symbolic expression or equation	Solves real-world problems using reasoning strategies	• Solves open sentences with calculations on both sides of the sentence
Solves real-world problems using reasoning strategies	• Uses powers to represent 10, 100, 1000, 10,000, and 100,000	Solves 2-step open sentences with missing factors
		Solves 1-step linear equations
		Solves 2-step linear equations
		Solves linear equations with decimals
		Solves linear equations with integers
		Writes equivalent forms of algebraic equations using addition and subtraction
		Solves open sentences with decimals
		Solves linear equations in a real-world context using a given formula
		Applies algebraic methods to solve theoretical problems
		Applies algebraic methods to solve real-world problems
		Uses graphs to solve simple systems of linear equations
	Applies systems-of-linear-equations methods to solve theoretical problems	
		• Describes the relationship or a real-world situation represented by a simple linear inequality (e.g., 1- or 2-step)
		 Solves real-world problems using reasoning strategies
		• Uses powers to represent 10, 100, 1000, 10,000, and 100,000

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range: 211 - 220 Statements Last Updated: Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 201 - 210	Skills and Concepts to Develop (50% Probability*) 211 - 220	Skills and Concepts to Introduce (27% Probability*) 221 - 230
Expressions and Equations	Expressions and Equations	Expressions and Equations
		Writes a number expressed in scientific notation in standard form
Use Functions to Model Relationships	Use Functions to Model Relationships	Use Functions to Model Relationships
 Extends a growing arithmetic pattern, defined by objects or diagrams Completes a simple function table based on real-life situations (e.g., the number of tricycles related to the number of wheels) Completes a function table given a simple rule (e.g., x + 2) Predicts from simple charts and tables 	 Completes a function table given a simple rule (e.g., x + 2) Solves problems involving simple functions Looks for a growing pattern to solve a problem Interprets data in line graphs (e.g., change over time) 	 Extends a growing pattern of triangular numbers, defined by objects or diagrams Represents geometric sequences using written descriptions in recursive terms (present term, next term) Solves problems involving simple functions Looks for a growing pattern to solve a problem
New Vocabulary: minimum, plus	New Vocabulary: None	New Vocabulary: algebra, net, reflexive, short, transitive
New Signs and Symbols: °C degrees Celsius, = is equal to, min minute, - negative number, p.m., + positive number	New Signs and Symbols: () parenthesis around an integer, a.m., ¢ cent sign, °F degrees Fahrenheit, \$ dollar sign, lb pound, mph miles per hour	New Signs and Symbols: < less than, m meter/metre, repeating decimal overbar, ∆ triangle

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range:221 - 230Statements Last Updated:Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 211 - 220	Skills and Concepts to Develop (50% Probability*) 221 - 230	Skills and Concepts to Introduce (27% Probability*) 231 - 240
Expressions and Equations	Expressions and Equations	Expressions and Equations
 Uses rounding to estimate answers to 2-step problems involving money (using decimals) 	 Solves real-world problems involving rate of pay Solves difficult real-world problems involving decimals (e.g., multiple 	 Evaluates numerical expressions using the order of operations (whole numbers only)
 Demonstrates an understanding of the associative property of multiplication 	multiplications, conversions)	 Evaluates expressions using the order of operations, including exponents (whole numbers only)
Demonstrates an understanding of the distributive property of	Uses the distributive property Colouidates the violue of a power (a.g., 242, 8)	 Solves real-world problems involving rate of pay
multiplication by decomposing a term	• Calculates the value of a power (e.g., 2^3 = 8)	 Solves real-world problems involving rate of pay with time and a half
 Calculates the value of a power (e.g., 2³ = 8) 	Solves problems involving simple interest rates with the formula	Solves difficult real-world problems involving decimals (e.g., multiple
 Uses a table of input/output values to represent patterns 	Uses a table of input/output values to represent patterns	multiplications, conversions)
 Understands equivalence and extends the concept to number sentences involving variables (e.g., 8 + 2 = [] + 2) 	Uses basic operations on algebraic expressions (substituting for unknowns)	 Evaluates numerical expressions using the order of operations (using integers)
Uses algebraic reasoning to solve problems involving equality	 Recognizes commutative, associative, distributive, symmetric, transitive, and reflexive properties 	Divides rational expressions in a/b form
relationships	Uses basic operations on algebraic expressions (expanding -	Uses the distributive property
 Uses simple linear equations to represent problem situations 	monomial by a binomial)	• Calculates the power of a number (e.g., $8 = 2^3$)
Solves simple open sentences with missing factors (numbers over 100)	• Demonstrates an understanding of properties (e.g., commutative,	 Evaluates expressions containing powers (e.g., 3² x 2³)
 Solves open sentences using the distributive property 	associative, distributive, properties of 0)	 Applies rules for multiplying and dividing powers
Solves open sentences with calculations on both sides of the sentence	• Writes equivalent forms of algebraic expressions (e.g., $(x + 3)/2 = x/2 + 2/2$)	 Solves problems with scientific notation
Solves 2-step open sentences with missing factors	3/2)Represents relationships of quantities in the form of an expression	Describes and uses a variable with whole numbers, multiplication, and
Solves 1-step linear equations	Uses basic operations on algebraic expressions (uses correct order of	division in a contextual situation
Applies algebraic methods to solve theoretical problems	operations)	 Uses expressions to represent situations that involve variable quantities with exponents
Translates a 2-step problem to a symbolic expression or equation	 Expresses a simple linear equation from a contextual situation 	Uses basic operations on algebraic expressions (substituting for
Solves real-world problems using reasoning strategies	Solves open sentences with calculations on both sides of the sentence	unknowns)
• Uses powers to represent 10, 100, 1000, 10,000, and 100,000	 Solves 2-step open sentences with missing factors 	 Uses basic operations on algebraic expressions (substituting for
	 Solves 1-step linear equations 	unknown exponents)
	Solves 2-step linear equations	 Recognizes commutative, associative, distributive, symmetric, transitive, and reflexive properties
	Solves linear equations with decimals	 Uses basic operations on algebraic expressions (combining like terms)
	 Solves linear equations with integers Writes equivalent forms of algebraic equations using addition and 	 Uses basic operations on algebraic expressions (expanding - monomial by a binomial)
	subtraction Solves open sentences with decimals 	• Writes equivalent forms of algebraic expressions (e.g., $(x + 3)/2 = x/2 + 3/2$)
	 Solves linear equations in a real-world context using a given formula 	 Represents relationships of quantities in the form of an expression
	 Applies algebraic methods to solve theoretical problems 	Uses basic operations on algebraic expressions (uses correct order of
	 Applies algebraic methods to solve real-world problems 	operations)
	 Uses graphs to solve simple systems of linear equations 	 Expresses a simple linear equation from a contextual situation
	 Applies systems-of-linear-equations methods to solve theoretical problems 	 Solves 2-step open sentences with missing factors (variables on both sides of the sentence)
	Describes the relationship or a real-world situation represented by a	Solves 2-step linear equations
	simple linear inequality (e.g., 1- or 2-step)	Solves linear equations with integers
	 Solves real-world problems using reasoning strategies 	Solves linear equations with fractions
	• Uses powers to represent 10, 100, 1000, 10,000, and 100,000	 Solves linear equations using rational numbers

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range: 221 - 230 Statements Last Updated: Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 211 - 220	Skills and Concepts to Develop (50% Probability*) 221 - 230	Skills and Concepts to Introduce (27% Probability*) 231 - 240
Expressions and Equations	Expressions and Equations	Expressions and Equations
	Writes a number expressed in scientific notation in standard form	Applies algebraic methods to solve real-world problems
		Determines slope from a linear equation
		• Uses polynomial equations to solve complex real-world problems (e.g., using distributive property, variables on both sides)
		Uses graphs to solve simple systems of linear equations
		 Solves simple one-step inequality open sentences
		Expresses a simple linear inequality from a contextual situation
		• Describes the relationship or a real-world situation represented by a simple linear inequality (e.g., 1- or 2-step)
		 Solves simple linear inequalities using graphs
		• Solves problems involving capacity in the metric system and converts to larger or smaller units
		Converts from Celsius to Fahrenheit, given conversion ratios
		 Determines the prime factorization of a number
		Writes a whole number in scientific notation
Use Functions to Model Relationships	Use Functions to Model Relationships	Use Functions to Model Relationships
 Completes a function table given a simple rule (e.g., x + 2) 	• Extends a growing pattern of triangular numbers, defined by objects or	Recognizes and extends arithmetic sequences (predicts nth term)
 Solves problems involving simple functions Looks for a growing pattern to solve a problem 	diagrams Represents geometric sequences using written descriptions in 	Represents geometric sequences using written descriptions in recursive terms (present term, next term)
Interprets data in line graphs (e.g., change over time)	recursive terms (present term, next term)	 Recognizes and extends the Fibonacci sequence
	Solves problems involving simple functions	Writes linear equations when given ordered pairs
	 Looks for a growing pattern to solve a problem 	• Writes the equation of a horizontal or vertical line when given the graph of the line
		 Represents real-world functions using an equation
		 Uses mapping diagrams to represent functions
		Uses tables to determine function equations
		Identifies the graph type, given equations of linear and nonlinear functions
		 Solves problems involving simple functions
		 Solves problems involving complex functions
		 Interprets data given in line graphs to solve problems
New Vocabulary: None New Signs and Symbols: () parenthesis around an integer, a.m., ¢ cent	New Vocabulary: algebra, net, reflexive, short, transitive New Signs and Symbols: < less than, m meter/metre, repeating decimal	New Vocabulary: algebraic sentence, depreciate, equation of a line, is less than, regression equation, time-and-a-half
sign, °F degrees Fahrenheit, \$ dollar sign, lb pound, mph miles per hour	overbar, \triangle triangle	New Signs and Symbols: \leq , \geq , () ordered pair, f(x) the value of the function f at x, > greater than, > greater than, \geq greater than or equal to, km kilometer/kilometre, \leq less than or equal to, • multiplication symbol (dot), - subtraction

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range:231 - 240Statements Last Updated:Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 221 - 230	Skills and Concepts to Develop (50% Probability*) 231 - 240	Skills and Concepts to Introduce (27% Probability*) 241 - 250
Expressions and Equations	Expressions and Equations	Expressions and Equations
 Solves real-world problems involving rate of pay Solves difficult real-world problems involving decimals (e.g., multiple 	• Evaluates numerical expressions using the order of operations (whole numbers only)	 Evaluates expressions using the order of operations, including exponents (whole numbers only)
multiplications, conversions)	• Evaluates expressions using the order of operations, including	Solves real-world problems involving rate of pay with time and a half
Uses the distributive property	exponents (whole numbers only)	• Evaluates numerical expressions using the order of operations (using
 Calculates the value of a power (e.g., 2³ = 8) 	 Solves real-world problems involving rate of pay 	integers)
 Solves problems involving simple interest rates with the formula 	Solves real-world problems involving rate of pay with time and a half	• Evaluates expressions using the order of operations, including
 Uses a table of input/output values to represent patterns 	Solves difficult real-world problems involving decimals (e.g., multiple multiplications, conversions)	exponents (using integers)
 Uses basic operations on algebraic expressions (substituting for unknowns) 	multiplications, conversions)Evaluates numerical expressions using the order of operations (using	 Solves problems involving simple interest rates without the formula Simplifies rational expressions with scientific notation
Recognizes commutative, associative, distributive, symmetric,	integers)	 Solves problems with scientific notation
transitive, and reflexive properties	Divides rational expressions in a/b form	• Describes and uses a variable with whole numbers, multiplication, and
 Uses basic operations on algebraic expressions (expanding - 	Uses the distributive property	division in a contextual situation
monomial by a binomial)Demonstrates an understanding of properties (e.g., commutative,	• Calculates the power of a number (e.g., $8 = 2^{3}$)	 Uses expressions to represent situations that involve variable quantities with exponents
associative, distributive, properties of 0)	 Evaluates expressions containing powers (e.g., 3² x 2³) Applies rules for multiplying and dividing powers 	 Evaluates expressions by substituting with rational numbers
• Writes equivalent forms of algebraic expressions (e.g., $(x + 3)/2 = x/2 +$	Solves problems with scientific notation	Simplifies polynomial expressions
3/2)	Describes and uses a variable with whole numbers, multiplication, and	Multiplies binomials
 Represents relationships of quantities in the form of an expression 	division in a contextual situation	 Factors trinomials in the form x² + bx + c
 Uses basic operations on algebraic expressions (uses correct order of operations) 	Uses expressions to represent situations that involve variable	 Factors polynomials using difference of squares
Expresses a simple linear equation from a contextual situation	quantities with exponents	Uses basic operations on algebraic expressions (uses correct order of
Solves open sentences with calculations on both sides of the sentence	Uses basic operations on algebraic expressions (substituting for unknowns)	operations)
 Solves 2-step open sentences with missing factors 	Uses basic operations on algebraic expressions (substituting for	 Uses linear equations to represent situations involving variable quantities
Solves 1-step linear equations	unknown exponents)	Solves 2-step open sentences with missing factors (variables on both
Solves 2-step linear equations	Recognizes commutative, associative, distributive, symmetric,	sides of the sentence)
 Solves linear equations with decimals 	transitive, and reflexive properties	 Solves linear equations with fractions
 Solves linear equations with integers 	 Uses basic operations on algebraic expressions (combining like terms) Uses basic operations on algebraic expressions (expanding - 	 Solves linear equations using rational numbers
Writes equivalent forms of algebraic equations using addition and	monomial by a binomial)	Solves open sentences with fractions
subtraction	• Writes equivalent forms of algebraic expressions (e.g., $(x + 3)/2 = x/2 +$	Applies algebraic methods to solve real-world problems
Solves open sentences with decimals	3/2)	 Applies algebraic methods to solve a variety of real-world and theoretical problems
Solves linear equations in a real-world context using a given formula	Represents relationships of quantities in the form of an expression	Solves problems involving consecutive numbers
Applies algebraic methods to solve theoretical problems	 Uses basic operations on algebraic expressions (uses correct order of operations) 	Uses polynomial equations to solve complex real-world problems (e.g.,
Applies algebraic methods to solve real-world problems	Expresses a simple linear equation from a contextual situation	using distributive property, variables on both sides)
 Uses graphs to solve simple systems of linear equations Applies systems-of-linear-equations methods to solve theoretical 	Solves 2-step open sentences with missing factors (variables on both	 Uses algebraic methods to solve systems of linear equations
problems	sides of the sentence)	 Solves simple one-step inequality open sentences
• Describes the relationship or a real-world situation represented by a	Solves 2-step linear equations	 Solves single variable linear inequalities with the variable in only one member using number lines
simple linear inequality (e.g., 1- or 2-step)	 Solves linear equations with integers 	Describes the relationship or a real-world situation represented by a
Solves real-world problems using reasoning strategies	 Solves linear equations with fractions 	simple linear inequality (e.g., 1- or 2-step)
• Uses powers to represent 10, 100, 1000, 10,000, and 100,000	 Solves linear equations using rational numbers 	 Solves linear inequalities using graphs

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range: 231 - 240 Statements Last Updated: Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 221 - 230	Skills and Concepts to Develop (50% Probability*) 231 - 240	Skills and Concepts to Introduce (27% Probability*) 241 - 250
Expressions and Equations	Expressions and Equations	Expressions and Equations
• Writes a number expressed in scientific notation in standard form	Applies algebraic methods to solve real-world problems	 Solves complex real-world problems involving capacity
	Determines slope from a linear equation	Solves problems involving capacity in the metric system and converts
	• Uses polynomial equations to solve complex real-world problems (e.g.,	to larger or smaller units
	using distributive property, variables on both sides)	Converts from Celsius to Fahrenheit, given conversion ratios
	Uses graphs to solve simple systems of linear equations	 Uses reasoning strategies to solve problems
	Solves simple one-step inequality open sentences	Determines the prime factorization of a number using powers
	Expresses a simple linear inequality from a contextual situation	Writes a whole number in scientific notation
	• Describes the relationship or a real-world situation represented by a simple linear inequality (e.g., 1- or 2-step)	Writes a decimal in scientific notation
	 Solves simple linear inequalities using graphs 	
	• Solves problems involving capacity in the metric system and converts to larger or smaller units	
	Converts from Celsius to Fahrenheit, given conversion ratios	
	Determines the prime factorization of a number	
	Writes a whole number in scientific notation	
Use Functions to Model Relationships	Use Functions to Model Relationships	Use Functions to Model Relationships
 Extends a growing pattern of triangular numbers, defined by objects or diagrams 	Recognizes and extends arithmetic sequences (predicts nth term)	Represents growing arithmetic patterns using algebraic expressions or equations
Represents geometric sequences using written descriptions in	Represents geometric sequences using written descriptions in recursive terms (present term, next term)	Writes linear equations when given ordered pairs
recursive terms (present term, next term)	 Recognizes and extends the Fibonacci sequence 	Writes the equation of a horizontal or vertical line when given the
Solves problems involving simple functions	Writes linear equations when given ordered pairs	graph of the line
Looks for a growing pattern to solve a problem	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
	Represents real-world functions using an equation	Solves quadratic equations using concrete models and tables
	Uses mapping diagrams to represent functions	Uses tables to determine function equations
	Uses tables to determine function equations	Represents a real-world function using a complex equation (e.g.,
	Identifies the graph type, given equations of linear and nonlinear	variables on both sides, distributive, rational)
	functions	 Models real life functions using function notation
	 Solves problems involving simple functions 	Determines the minimum and maximum of a quadratic function
	 Solves problems involving complex functions 	Analyzes the properties and characteristics of exponential functions
	 Interprets data given in line graphs to solve problems 	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
New Vocabulary: algebra, net, reflexive, short, transitive	New Vocabulary: algebraic sentence, depreciate, equation of a line, is	New Vocabulary: polynomial, solution set, y-intercept
New Signs and Symbols: < less than, m meter/metre, repeating decimal	less than, regression equation, time-and-a-half	New Signs and Symbols: % percent
overbar, \triangle triangle	New Signs and Symbols: \leq , \geq , () ordered pair, f(x) the value of the function f at x, > greater than, > greater than, \geq greater than or equal to, km kilometer/kilometre, \leq less than or equal to, • multiplication symbol (dot), - subtraction	

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range: 241 - 250 Statements Last Updated: Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 231 - 240	Skills and Concepts to Develop (50% Probability*) 241 - 250	Skills and Concepts to Introduce (27% Probability*) 251 - 260
Expressions and Equations	Expressions and Equations	Expressions and Equations
• Evaluates numerical expressions using the order of operations (whole	• Evaluates expressions using the order of operations, including	 Simplifies rational expressions with exponents
numbers only)	exponents (whole numbers only)	 Solves problems with scientific notation
 Evaluates expressions using the order of operations, including exponents (whole numbers only) 	Solves real-world problems involving rate of pay with time and a half Subjustes superside uncertainty units the order of acceptions (units	Describes and uses a variable with whole numbers, multiplication, and division is a contactual situation
Solves real-world problems involving rate of pay	 Evaluates numerical expressions using the order of operations (using integers) 	division in a contextual situation
Solves real-world problems involving rate of pay with time and a half	 Evaluates expressions using the order of operations, including 	 Uses expressions to represent situations that involve variable quantities with exponents
Solves difficult real-world problems involving decimals (e.g., multiple	exponents (using integers)	 Evaluates expressions by substituting with rational numbers
multiplications, conversions)	Solves problems involving simple interest rates without the formula	Simplifies monomials
 Evaluates numerical expressions using the order of operations (using integers) 	Simplifies rational expressions with scientific notation	 Simplifies polynomial expressions
Divides rational expressions in a/b form	Solves problems with scientific notation	 Simplifies algebraic expressions with integer exponents
Uses the distributive property	 Describes and uses a variable with whole numbers, multiplication, and division in a contextual situation 	Multiplies binomials
 Calculates the power of a number (e.g., 8 = 2³) 	Uses expressions to represent situations that involve variable	 Multiplies a polynomial by a polynomial
 Evaluates expressions containing powers (e.g., 3² x 2³) 	quantities with exponents	 Divides a polynomial by a monomial
Applies rules for multiplying and dividing powers	 Evaluates expressions by substituting with rational numbers 	 Factors polynomials by identifying common factors
Solves problems with scientific notation	Simplifies polynomial expressions	 Factors trinomials in the form x² + bx + c
Describes and uses a variable with whole numbers, multiplication, and	Multiplies binomials	 Factors polynomials using difference of squares
division in a contextual situation	• Factors trinomials in the form $x^2 + bx + c$	 Writes equivalent forms of algebraic equations using multiplication and division
 Uses expressions to represent situations that involve variable 	 Factors polynomials using difference of squares 	Solves linear equations using rational numbers
quantities with exponentsUses basic operations on algebraic expressions (substituting for	 Uses basic operations on algebraic expressions (uses correct order of operations) 	Applies algebraic methods to solve complex real-world and theoretical
unknowns)	Uses linear equations to represent situations involving variable	problems
Uses basic operations on algebraic expressions (substituting for	quantities	 Rewrites a complex formula to solve for a specific variable
unknown exponents)	Solves 2-step open sentences with missing factors (variables on both	 Identifies discriminants and roots
 Recognizes commutative, associative, distributive, symmetric, transitive, and reflexive properties 	sides of the sentence)	 Solves quadratic equations by factoring
Uses basic operations on algebraic expressions (combining like terms)	Solves linear equations with fractions	 Solves quadratic equations by completing the square
Uses basic operations on algebraic expressions (combining like terms) Uses basic operations on algebraic expressions (expanding -	Solves linear equations using rational numbers	• Solves polynomial equations (e.g., $ax = b + cx$, $a(x + b) = c$, $ax + b = cx + d$, $a(bx + c) = d(ex + f)$, $a/x = b$)
monomial by a binomial)	 Solves open sentences with fractions Applies algebraic methods to solve real-world problems 	Uses polynomial equations to solve area and perimeter problems
• Writes equivalent forms of algebraic expressions (e.g., $(x + 3)/2 = x/2 + x/2$	Applies algebraic methods to solve a variety of real-world and	 Solves polynomial equations with integers as exponents
3/2)	theoretical problems	Uses the Multiplication Property of Equality as a first step in solving
Represents relationships of quantities in the form of an expression	 Solves problems involving consecutive numbers 	systems of linear equations
 Uses basic operations on algebraic expressions (uses correct order of operations) 	• Uses polynomial equations to solve complex real-world problems (e.g.,	 Uses substitution as a first step in solving systems of linear equations
 Expresses a simple linear equation from a contextual situation 	using distributive property, variables on both sides)	 Uses algebraic methods to solve systems of linear equations
Solves 2-step open sentences with missing factors (variables on both	 Uses algebraic methods to solve systems of linear equations 	 Uses graphs to solve systems of linear equations
sides of the sentence)	 Solves simple one-step inequality open sentences 	 Solves real-world systems of linear equations
Solves 2-step linear equations	 Solves single variable linear inequalities with the variable in only one member using number lines 	 Solves single variable linear inequalities with the variable in only one member using number lines
 Solves linear equations with integers 	Describes the relationship or a real-world situation represented by a	Solves single variable linear inequalities with variable in both members
 Solves linear equations with fractions 	simple linear inequality (e.g., 1- or 2-step)	using number lines
 Solves linear equations using rational numbers 	Solves linear inequalities using graphs	

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range: 241 - 250 Statements Last Updated: Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 231 - 240	Skills and Concepts to Develop (50% Probability*) 241 - 250	Skills and Concepts to Introduce (27% Probability*) 251 - 260
Expressions and Equations	Expressions and Equations	Expressions and Equations
 Applies algebraic methods to solve real-world problems Determines slope from a linear equation Uses polynomial equations to solve complex real-world problems (e.g., using distributive property, variables on both sides) Uses graphs to solve simple systems of linear equations Solves simple one-step inequality open sentences Expresses a simple linear inequality from a contextual situation Describes the relationship or a real-world situation represented by a simple linear inequality (e.g., 1- or 2-step) Solves simple linear inequalities using graphs Solves problems involving capacity in the metric system and converts to larger or smaller units Converts from Celsius to Fahrenheit, given conversion ratios Determines the prime factorization of a number 	 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)
Writes a whole number in scientific notation Use Functions to Model Relationships	Use Functions to Model Relationships	Use Functions to Model Relationships
 Recognizes and extends arithmetic sequences (predicts nth term) Represents geometric sequences using written descriptions in recursive terms (present term, next term) Recognizes and extends the Fibonacci sequence Writes linear equations when given ordered pairs Writes the equation of a horizontal or vertical line when given the graph of the line Represents real-world functions using an equation Uses mapping diagrams to represent functions Uses tables to determine function equations Identifies the graph type, given equations of linear and nonlinear functions Solves problems involving simple functions Interprets data given in line graphs to solve problems 	 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 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

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range: 241 - 250 Statements Last Updated: Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*)	Skills and Concepts to Develop (50% Probability*)	Skills and Concepts to Introduce (27% Probability*)
231 - 240	241 - 250	251 - 260
New Vocabulary: algebraic sentence, depreciate, equation of a line, is	New Vocabulary: polynomial, solution set, y-intercept	New Vocabulary: coordinate plane, quadratic equation, undefined, wider,
less than, regression equation, time-and-a-half	New Signs and Symbols: % percent	x-coordinate, y-coordinate
New Signs and Symbols: \leq , \geq , () ordered pair, f(x) the value of the function f at x, > greater than, > greater than, \geq greater than or equal to, km kilometer/kilometre, \leq less than or equal to, • multiplication symbol (dot), - subtraction		New Signs and Symbols: [] square brackets, { } set notation, P perimeter

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

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	 Simplifies rational expressions with exponents 	Simplifies rational expressions with exponents
exponents (whole numbers only)	 Solves problems with scientific notation 	Simplifies rational expressions with negative exponents
 Solves real-world problems involving rate of pay with time and a half Evaluates numerical expressions using the order of operations (using 	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)
integers)	Uses expressions to represent situations that involve variable	Uses the compound interest equation to solve problems
Evaluates expressions using the order of operations, including	quantities with exponents	Simplifies monomials
exponents (using integers)	 Evaluates expressions by substituting with rational numbers 	Simplifies polynomial expressions using power laws
Solves problems involving simple interest rates without the formula	Simplifies monomials	• Factors polynomials by identifying a common monomial and then
Simplifies rational expressions with scientific notation	 Simplifies polynomial expressions 	factoring the trinomial
Solves problems with scientific notation	 Simplifies algebraic expressions with integer exponents 	Rewrites a complex formula to solve for a specific variable
Describes and uses a variable with whole numbers, multiplication, and division in a contextual situation	Multiplies binomials	 Solves quadratic equations using the quadratic formula
Uses expressions to represent situations that involve variable	 Multiplies a polynomial by a polynomial 	 Solves quadratic equations by completing the square
quantities with exponents	Divides a polynomial by a monomial	 Solves real-world systems of linear equations
 Evaluates expressions by substituting with rational numbers 	 Factors polynomials by identifying common factors 	 Solves polynomial inequalities
Simplifies polynomial expressions	 Factors trinomials in the form x² + bx + c 	 Uses graphs to solve systems of linear inequalities
Multiplies binomials	 Factors polynomials using difference of squares 	
• Factors trinomials in the form $x^2 + bx + c$	Writes equivalent forms of algebraic equations using multiplication and	
 Factors polynomials using difference of squares 	division	
Uses basic operations on algebraic expressions (uses correct order of operations)	 Solves linear equations using rational numbers Applies algebraic methods to solve complex real-world and theoretical 	
Uses linear equations to represent situations involving variable	problems	
quantities	 Rewrites a complex formula to solve for a specific variable 	
Solves 2-step open sentences with missing factors (variables on both	 Identifies discriminants and roots 	
sides of the sentence)	 Solves quadratic equations by factoring 	
 Solves linear equations with fractions 	 Solves quadratic equations by completing the square 	
 Solves linear equations using rational numbers 	• Solves polynomial equations (e.g., $ax = b + cx$, $a(x + b) = c$, $ax + b = c$	
 Solves open sentences with fractions 	cx + d, $a(bx + c) = d(ex + f)$, $a/x = b$)	
 Applies algebraic methods to solve real-world problems 	Uses polynomial equations to solve area and perimeter problems	
 Applies algebraic methods to solve a variety of real-world and theoretical problems 	 Solves polynomial equations with integers as exponents Uses the Multiplication Property of Equality as a first step in solving 	
 Solves problems involving consecutive numbers 	systems of linear equations	
• Uses polynomial equations to solve complex real-world problems (e.g.,	Uses substitution as a first step in solving systems of linear equations	
using distributive property, variables on both sides)	Uses algebraic methods to solve systems of linear equations	
Uses algebraic methods to solve systems of linear equations	Uses graphs to solve systems of linear equations	
Solves simple one-step inequality open sentences	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 the variable in only one member using number lines	
• Describes the relationship or a real-world situation represented by a simple linear inequality (e.g., 1- or 2-step)	• Solves single variable linear inequalities with variable in both members using number lines	
 Solves linear inequalities using graphs 		

Solves linear inequalities using graphs

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

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
 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 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,	New Vocabulary: geometric series, semi-annual
New Signs and Symbols: % percent	x-coordinate, y-coordinate New Signs and Symbols: [] square brackets, { } set notation, P perimeter	New Signs and Symbols: P principal, r rate, t time

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range: 261 - 270 Statements Last Updated: Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 251 - 260	Skills and Concepts to Develop (50% Probability*) 261 - 270	Skills and Concepts to Introduce (27% Probability*) 271 - 280
Expressions and Equations	Expressions and Equations	Expressions and Equations
 Simplifies rational expressions with exponents 	 Simplifies rational expressions with exponents 	• Describes a relationship or a real-world situation represented by a
 Solves problems with scientific notation 	 Simplifies rational expressions with negative exponents 	quadratic equation
• 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) 	
 Uses expressions to represent situations that involve variable quantities with exponents 	 Uses the compound interest equation to solve problems Simplifies monomials 	
 Evaluates expressions by substituting with rational numbers 	Simplifies polynomial expressions using power laws	
Simplifies monomials	Factors polynomials by identifying a common monomial and then	
Simplifies polynomial expressions	factoring the trinomial	
 Simplifies algebraic expressions with integer exponents 	 Rewrites a complex formula to solve for a specific variable 	
Multiplies binomials	 Solves quadratic equations using the quadratic formula 	
 Multiplies a polynomial by a polynomial 	 Solves quadratic equations by completing the square 	
 Divides a polynomial by a monomial 	 Solves real-world systems of linear equations 	
 Factors polynomials by identifying common factors 	 Solves polynomial inequalities 	
 Factors trinomials in the form x² + bx + c 	 Uses graphs to solve systems of linear inequalities 	
 Factors polynomials using difference of squares 		
Writes equivalent forms of algebraic equations using multiplication and division		
 Solves linear equations using rational numbers 		
Applies algebraic methods to solve complex real-world and theoretical problems		
 Rewrites a complex formula to solve for a specific variable 		
 Identifies discriminants and roots 		
 Solves quadratic equations by factoring 		
 Solves quadratic equations by completing the square 		
• Solves polynomial equations (e.g., $ax = b + cx$, $a(x + b) = c$, $ax + b = cx + d$, $a(bx + c) = d(ex + f)$, $a/x = b$)		
 Uses polynomial equations to solve area and perimeter problems 		
 Solves polynomial equations with integers as exponents 		
 Uses the Multiplication Property of Equality as a first step in solving systems of linear equations 		
Uses substitution as a first step in solving systems of linear equations		
Uses algebraic methods to solve systems of linear equations		
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



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range: 261 - 270 Statements Last Updated: Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 251 - 260	Skills and Concepts to Develop (50% Probability*) 261 - 270	Skills and Concepts to Introduce (27% Probability*) 271 - 280
Expressions and Equations	Expressions and Equations	Expressions and Equations
 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
Uses an algebraic expression to represent a triangular number pattern	Writes the equation of the line when given the graph of the line	
 Rewrites an equation for a line in standard form 	 Writes linear equations, given slope and point on a line 	
 Determines x- or y-intercept of a given linear equation 	 Models real life functions using function notation 	
 Writes the equation of the line when given the graph of the line 	Determines the minimum and maximum of a quadratic function	
 Determines the graph of a line when given the equation 	Analyzes the properties and characteristics of exponential functions	
 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 		
New Vocabulary: coordinate plane, quadratic equation, undefined, wider, x-coordinate, y-coordinate	New Vocabulary: geometric series, semi-annual New Signs and Symbols: P principal, r rate, t time	New Vocabulary: None New Signs and Symbols: None
New Signs and Symbols: [] square brackets, { } set notation, P perimeter	riow orgins and Symbols. E philopai, Flate, Lume	Now Signs and Symbols. None

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range: 271 - 280 Statements Last Updated: Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 261 - 270	Skills and Concepts to Develop (50% Probability*) 271 - 280	Skills and Concepts to Introduce (27% Probability*) > 280
Expressions and Equations	Expressions and Equations	Expressions and Equations
 Simplifies rational expressions with exponents 	Describes a relationship or a real-world situation represented by a	Describes a relationship or a real-world situation represented by a
 Simplifies rational expressions with negative exponents 	quadratic equation	quadratic equation
 Estimates the limit of a given infinite sequence (e.g., given the sequence 1/n, as n gets larger) 		
 Uses the compound interest equation to solve problems 		
Simplifies monomials		
 Simplifies polynomial expressions using power laws 		
 Factors polynomials by identifying a common monomial and then factoring the trinomial 		
 Rewrites a complex formula to solve for a specific variable 		
 Solves quadratic equations using the quadratic formula 		
 Solves quadratic equations by completing the square 		
 Solves real-world systems of linear equations 		
 Solves polynomial inequalities 		
 Uses graphs to solve systems of linear inequalities 		
New Vocabulary: geometric series, semi-annual	New Vocabulary: None	New Vocabulary: None
New Signs and Symbols: P principal, r rate, t time	New Signs and Symbols: None	New Signs and Symbols: None

Explanatory Notes



Mathematics

Goal: Operations and Algebraic Thinking

RIT Score Range:> 280Statements Last Updated:Aug 4, 2014

Skills and Concepts to Enhance (73% Probability*) 271 - 280	Skills and Concepts to Develop (50% Probability*) > 280
Expressions and Equations	Expressions and Equations
 Describes a relationship or a real-world situation represented by a quadratic equation 	 Describes a relationship or a real-world situation represented by a quadratic equation
New Vocabulary: None	New Vocabulary: None
New Signs and Symbols: None	New Signs and Symbols: None

Explanatory Notes