

Math: The Real and Complex Number Systems: Perform Operations

Students: DesCartes Statements:

Students:

RIT Above 260:

- Performs operations on complex numbers and expresses the results in simplest form

Students:

RIT 251-260:

- Performs operations on complex numbers and expresses the results in simplest form
- Uses factor and multiple concepts to solve difficult problems
- Uses the additive inverse property with rational numbers

Students:

RIT 241-250:

- Identifies the least common multiple of whole numbers
- Subtracts integers
- Uses a number line to determine the distance between a positive and negative number
- Uses factor and multiple concepts to solve difficult problems
- Uses the multiplicative inverse property with rational numbers

Students:

RIT 231-240:

- Adds fractions with unlike denominators with reducing or converting to a mixed fraction
- Adds integers with unlike signs
- Adds mixed fractions where converting from improper fractions is necessary
- Adds several positive and negative integers
- Adds simple mixed fractions with unlike denominators (e.g., halves, thirds, fourths, eighths)
- Divides a decimal by 10, 100, 1000
- Divides a decimal by a decimal
- Divides a fraction by a fraction
- Divides a fraction by a mixed fraction
- Divides a fraction by a whole number
- Divides a mixed fraction by a fraction
- Divides a mixed fraction by a mixed fraction
- Divides a mixed fraction by a whole number
- Divides a whole number by a decimal
- Divides a whole number by a fraction
- Divides a whole number by a mixed fraction
- Divides integers with like signs
- Divides multiple-digit numbers
- Divides numbers by powers of 10
- Identifies the additive inverse property
- Interprets data given in tables to solve problems
- Multiplies a decimal by 10, 100, 1000
- Multiplies integers with like signs
- Multiplies mixed fractions
- Multiplies rational expressions
- Solves 2- or more step real-world problems involving fractions with multiplication and division
- Solves problems involving addition and subtraction of integers
- Solves problems involving fractions (e.g., multiple operations, conversions)
- Solves real-world problems involving addition and subtraction of fractions where converting both denominators is necessary
- Subtracts a decimal from a whole number, horizontally
- Subtracts integers
- Subtracts rational expressions in decimal form
- Subtracts whole numbers, fractions, and mixed fractions
- Subtracts whole numbers, fractions, and mixed fractions with regrouping
- Uses models to multiply and divide fractions and connect the actions to algorithms
- Uses models to multiply and divide fractions and mixed fractions and connect the actions to algorithms
- Writes a fraction as a decimal and vice versa
- Writes a fraction as a mixed decimal and vice versa

Students:**RIT 221-230:**

- Adds decimals through the hundred-thousandths place
- Adds decimals to the hundredths place in horizontal format (not same number of digits)
- Adds fractions with like denominators with reducing or converting to a mixed fraction
- Adds fractions with unlike denominators with reducing or converting to a mixed fraction
- Adds fractions with unlike denominators without reducing
- Adds integers with unlike signs
- Adds mixed fractions where converting from improper fractions is necessary
- Adds rational expressions in decimal form
- Adds several positive and negative integers
- Adds simple mixed fractions with unlike denominators (e.g., halves, thirds, fourths, eighths)
- Calculate the sum of integers using a number line
- Computes the value of multiple bills and coins (multiplication/division)
- Computes with dollars and cents over \$5.00 and converts to decimals (multiplication/division)
- Demonstrates an understanding of multiple properties
- Determines factors of whole numbers
- Divides a 4-digit number by a 2-digit number
- Divides a decimal by 10, 100, 1000
- Divides a decimal by a decimal
- Divides a fraction by a fraction
- Divides a mixed fraction by a fraction
- Divides integers with like signs
- Divides integers with unlike signs
- Divides multiple-digit numbers
- Identifies common factors of two or more numbers
- Identifies the additive inverse property
- Identifies the greatest common factor of whole numbers
- Interprets data given in tables to solve problems
- Multiplies a decimal by 10, 100, 1000
- Multiplies a decimal by a decimal (factors to hundredths)
- Multiplies a decimal by a decimal (factors to thousandths)
- Multiplies a decimal by a decimal, vertical form (factors to tenths or hundredths)
- Multiplies a fraction by a fraction where reducing to simplest form is necessary
- Multiplies a fraction by a fraction without reducing to simplest form (complex problem)
- Multiplies a fraction by a whole number
- Multiplies integers with unlike signs
- Multiplies mixed fractions
- Multiplies multiple-digit numbers
- Solves 1-step real-world problems involving fractions with multiplication and division
- Solves 2- or more step real-world problems involving fractions with multiplication and division
- Solves complex word problems involving whole number division with remainder (e.g., 2-step, 2-digit divisor)
- Solves difficult problems involving elapsed time, with the conversion of hours
- Solves problems involving addition and subtraction of integers
- Solves problems involving fractions (e.g., multiple operations, conversions)
- Solves real-world multiple-step problems involving whole numbers
- Solves real-world problems involving addition and subtraction of fractions where converting one denominator is necessary
- Solves real-world problems involving addition and subtraction of integers
- Subtracts a decimal from a whole number, horizontally
- Subtracts decimals through the hundred-thousandths place, horizontally
- Subtracts decimals to the hundredths place (not same number of digits)
- Subtracts decimals to the thousandths place, horizontally, with and without regrouping
- Subtracts fractions with like denominators with reducing
- Subtracts fractions with unlike denominators with reducing
- Subtracts fractions with unlike denominators without reducing
- Subtracts integers
- Subtracts mixed fractions with unlike denominators with no regrouping
- Subtracts whole numbers, fractions, and mixed fractions
- Subtracts whole numbers, fractions, and mixed fractions with regrouping
- Uses factor and multiple concepts to solve simple problems
- Uses models to add and subtract integers and connect the actions to algorithms
- Uses models to multiply and divide fractions and connect the actions to algorithms

- Uses multiple number theory concepts to solve problems (e.g., factors, digits, odd/even, divisibility)
- Uses rounding to estimate answers to real-world problems involving multiplication and division of numbers less than 100 (whole numbers only)
- Uses rounding to estimate answers to real-world problems involving numbers 1000 or greater using multiplication and division (whole numbers only)
- Uses rounding to estimate answers to real-world problems involving numbers less than 1000 with multiplication and division (whole numbers only)
- Writes a fraction or mixed number as a decimal when the denominator is a multiple of 10
- Writes a simple mixed fraction as a decimal and vice versa

Students:

RIT 211-220:

- Adds decimals through the hundred-thousandths place
- Adds decimals to the hundredths place in horizontal format (not same number of digits)
- Adds decimals to the thousandths place horizontally with and without regrouping
- Adds fractions with like denominators with reducing or converting to a mixed fraction
- Adds fractions with like denominators without reducing
- Adds fractions with unlike denominators without reducing
- Adds integers with like signs
- Adds simple mixed fractions with unlike denominators (e.g., halves, thirds, fourths, eighths)
- Analyzes and computes 1 operation on real-world problems involving money over \$5.00 (addition/subtraction only)
- Analyzes and computes 1 operation on real-world problems involving money over \$5.00 (multiplication/division)
- Computes addition and subtraction on multiple-step real-world problems involving money
- Computes addition, subtraction, multiplication, and division on multiple-step, real-world problems involving money
- Computes the value of multiple bills and coins (addition/subtraction only)
- Computes with dollars and cents over \$5.00 and converts to decimals (multiplication/division)
- Demonstrates an understanding of the inverse relationship between addition and subtraction
- Demonstrates an understanding that division by 0 is undefined
- Determines factors of whole numbers
- Divides a 2-digit number or a 3-digit number by a 1-digit number with a remainder
- Divides a 3-digit number by a 2-digit number
- Divides a 4-digit number by a 1-digit number with no remainder
- Divides a 4-digit number by a 2-digit number
- Divides decimal by a whole number
- Divides integers with like signs
- Divides integers with unlike signs
- Divides multiple-digit numbers
- Expresses a percent as a decimal and vice versa
- Expresses a simple fraction as a decimal
- Expresses the equivalent form of a fraction, decimal, and/or percent (simple fraction)
- Identifies common factors of two or more numbers
- Identifies numbers as prime
- Identifies the greatest common factor of whole numbers
- Instantly recalls basic multiplication and division facts in a table
- Models whole number multiplication and division algorithms (e.g., uses physical materials to show 4 groups of 3 objects)
- Multiplies a 2-digit number by a 2-digit number with regrouping
- Multiplies a 3-digit number by a 2-digit number with regrouping
- Multiplies a 3-digit number by a 3-digit number
- Multiplies a 4- or more digit number by multiples of 100 or 1000
- Multiplies a decimal by a decimal (factors to hundredths)
- Multiplies a decimal by a decimal, vertical form (factors to tenths or hundredths)
- Multiplies a fraction by a fraction where reducing to simplest form is necessary
- Multiplies a fraction by a whole number
- Multiplies integers with unlike signs
- Multiplies multiple-digit numbers
- Performs mental computation with division
- Performs mental computation with multiplication
- Selects and uses the appropriate units depending on degree of accuracy required to solve problems
- Solves 1-step real-world problems involving fractions with multiplication and division
- Solves complex word problems involving whole number division with remainder (e.g., 2-step, 2-digit divisor)

- Solves difficult problems involving elapsed time, with the conversion of hours
- Solves real-world multiple-step problems involving whole numbers
- Solves real-world problems involving 2-step multiple operations, whole numbers only
- Solves real-world problems involving addition and subtraction of fractions where converting one denominator is necessary
- Solves real-world problems involving addition and subtraction of integers
- Solves whole number word problems with division over 10×10
- Subtracts decimals to the thousandths place, horizontally, with and without regrouping
- Subtracts fractions with unlike denominators without reducing
- Subtracts mixed fractions with like denominators with no regrouping
- Subtracts mixed fractions with unlike denominators with no regrouping
- Subtracts numbers with 5 digits or more with regrouping
- Subtracts simple fractions with unlike denominators without reducing (e.g., halves, quarters, thirds, eighths)
- Uses models to add and subtract integers and connect the actions to algorithms
- Uses models to multiply and divide fractions and connect the actions to algorithms
- Uses multiplication strategies to explain computation (e.g., doubles, 9-patterns, decomposing, partial products)
- Uses rounding to estimate answers to difficult multiplication and division problems (whole numbers only)
- Uses rounding to estimate answers to real-world problems involving multiplication and division of numbers less than 100 (whole numbers only)
- Uses rounding to estimate answers to real-world problems involving numbers 1000 or greater using multiplication and division (whole numbers only)
- Uses rounding to estimate answers to real-world problems involving numbers less than 1000 with multiplication and division (whole numbers only)
- Writes a fraction or mixed number as a decimal when the denominator is a multiple of 10
- Writes a simple mixed fraction as a decimal and vice versa

Students:

RIT 201-210:

- Adds decimals to the thousandths place horizontally with and without regrouping
- Adds fractions with like denominators without reducing
- Adds multiple-digit numbers with sums under 1000
- Adds multiple-digit numbers, with regrouping, with sums over 1000
- Adds whole numbers and fractions
- Computes addition and subtraction on multiple-step real-world problems involving money
- Computes addition, subtraction, multiplication, and division on multiple-step, real-world problems involving money
- Computes money problems with multiple operations (addition/subtraction only)
- Computes the value of multiple bills and coins (addition/subtraction only)
- Computes with dollars and cents up to and including \$5.00 and converts to decimals (multiplication/division)
- Determines the remainder in a real-world problem (whole numbers)
- Divides a 2-digit number by a 1-digit number with no remainder
- Divides a 2-digit number or a 3-digit number by a 1-digit number with a remainder
- Divides a 3-digit number by a 1-digit number with no remainder
- Divides a 3-digit number by a multiple of 10
- Divides a 4-digit number by a 1-digit number with no remainder
- Divides a 4-digit number by a 2-digit number
- Divides decimal by a whole number
- Expresses the equivalent form of a fraction, decimal, and/or percent (simple fraction)
- Instantly recalls basic multiplication and division facts in a table
- Instantly recalls division facts with dividend and divisors less than 13
- Models whole number multiplication and division algorithms (e.g., uses physical materials to show 4 groups of 3 objects)
- Multiplies a 2- or 3-digit number by multiples of 10 or 100
- Multiplies a 2-digit number by a 1-digit number with regrouping
- Multiplies a 2-digit number by a 2-digit number with regrouping
- Multiplies a 3- or 4-digit number by a 1-digit number
- Multiplies a 3-digit number by a 2-digit number with regrouping
- Multiplies a 3-digit number by a 3-digit number
- Multiplies a decimal by whole number
- Multiplies a fraction by a fraction without reducing to simplest form (simple problem)
- Multiplies multiple 1-digit numbers
- Performs mental computation with division
- Performs mental computation with more than 4 addends

- Performs mental computation with multiplication
- Solves problems involving measurement of time
- Solves problems using tables
- Solves problems using the inverse relationship between addition and subtraction
- Solves real-world 1-step problems involving addition and subtraction of fractions with like denominators
- Solves real-world problems involving 2-step multiple operations, whole numbers only
- Solves real-world problems involving addition and subtraction of integers
- Solves real-world whole number problems involving subtraction with numbers 100 and under (analysis)
- Solves simple problems involving elapsed time, with the conversion of hours
- Solves simple word problems involving whole number division with remainder (e.g., 1-step, 1-digit divisor)
- Solves whole number word problems with division over 10×10
- Solves word problems involving whole number multiplication with numbers greater than 10×10
- Solves word problems with whole number division facts with dividend and divisors less than 11
- Subtracts 3- or 4-digit numbers with regrouping
- Subtracts decimals through the hundred-thousandths place, vertically
- Subtracts decimals to the hundredths place (same number of digits) with regrouping
- Subtracts decimals to the thousandths place, vertically, with and without regrouping
- Subtracts fractions with like denominators without reducing
- Subtracts mixed fractions with like denominators with no regrouping
- Subtracts numbers with 5 digits or more with regrouping
- Uses division for multiple-step real-world problems (whole numbers)
- Uses models to add and subtract fractions and connect the actions to algorithms
- Uses rounding to estimate answers to addition and subtraction problems (whole numbers only)
- Uses rounding to estimate answers to real-world problems involving numbers 1000 or greater with addition and subtraction (whole numbers only)
- Writes a terminating decimal as a fraction or mixed number

Students:

RIT 191-200:

- Adds decimals to the hundredths place (same number of digits)
- Adds decimals to the hundredths place in vertical format (not same number of digits)
- Adds decimals to the thousandths place vertically with and without regrouping
- Adds money with regrouping
- Adds multiple-digit numbers with sums under 1000
- Adds multiple-digit numbers, with regrouping, with sums over 1000
- Adds two 3- and/or 4-digit numbers, with regrouping, with sums over 1000
- Computes 1 operation on real-world problems involving money over \$5.00 (addition/subtraction only)
- Computes 1 operation on real-world problems involving money over \$5.00 (multiplication/division)
- Computes basic operations with units of weight/mass
- Computes with dollars and cents up to and including \$5.00 and converts to decimals (addition/subtraction only)
- Computes with dollars and cents up to and including \$5.00 and converts to decimals (multiplication/division)
- Determines elapsed clock time
- Determines elapsed time involving whole hours, whole days, whole years
- Determines the operation needed from a simple problem
- Distinguishes between odd and even numbers
- Divides a 2-digit number by a 1-digit number with no remainder
- Finds equivalent combinations of coins with the same value
- Identifies numbers as composite
- Identifies the correct time, given the words, and vice versa
- Identifies the value of a collection of coins and bills to \$10.00 by "counting on" (without picture of money)
- Identifies the value of a collection of coins to \$1.00 (without picture of coins)
- Instantly recalls basic multiplication facts where one factor is 6-12 and the other factor is 0-12
- Instantly recalls division facts with dividend and divisors less than 10
- Instantly recalls division facts with dividend and divisors less than 13
- Makes change to \$1.00 by "counting on" or subtracting
- Models whole number multiplication and division algorithms (e.g., shows multiplication as repeated addition and division as repeated subtraction)
- Multiplies a 2- or 3-digit number by a 1-digit number with no regrouping
- Multiplies a 2-digit number by a 1-digit number with regrouping
- Multiplies a 2-digit number by a 2-digit number with no regrouping
- Multiplies a 3- or 4-digit number by a 1-digit number
- Multiplies a decimal by whole number
- Performs mental computation with multiplication

- Performs mental subtraction with numbers under 1000
- Solves problems using tables
- Solves problems using the inverse relationship between addition and subtraction
- Solves real-world 1-step problems involving addition and subtraction of fractions with like denominators
- Solves real-world 1-step problems involving multiplication or division of a whole number by a fraction
- Solves real-world problems involving decimals (not money) using addition and subtraction
- Solves real-world whole number addition problems with sums to 20 (change unknown)
- Solves real-world whole number addition problems with sums to 20 (result unknown) - with extraneous information given
- Solves real-world whole number problems involving subtraction with numbers 100 and under
- Solves simple problems involving elapsed time, with the conversion of hours
- Solves simple word problems involving whole number division with remainder (e.g., 1-step, 1-digit divisor)
- Solves whole number addition word problems with sums over 1000
- Solves word problems involving basic whole number multiplication facts to 10×10
- Solves word problems involving whole number multiplication with numbers greater than 10×10
- Solves word problems with whole number division facts with dividend and divisors less than 11
- Subtracts 1-digit number from a 2-digit number with regrouping
- Subtracts 3- or 4-digit numbers with regrouping
- Subtracts a 2-digit number from a 2-digit number, with regrouping
- Subtracts a 2-digit number from a 3-digit number with a single regrouping
- Subtracts decimals to the hundredths place (same number of digits) with regrouping
- Subtracts decimals to the thousandths place, vertically, with and without regrouping
- Subtracts fractions with like denominators without reducing
- Subtracts multiple-digit numbers with no regrouping
- Tells time to the nearest 1 minute
- Tells time to the nearest quarter hour
- Uses manipulatives to divide a small set of objects into groups of equal size
- Uses models to add and subtract fractions and connect the actions to algorithms
- Uses rounding to estimate answers to addition and subtraction problems (whole numbers only)
- Uses rounding to estimate answers to real-world problems involving numbers less than 1000 with addition and subtraction (whole numbers only)
- Uses strategies for sums and differences with 2-digit numbers (e.g., decomposing, compatible, compensation, partial sums, counting on)

Students:

RIT 181-190:

- Adds 3-digit numbers, with regrouping, with sums under 1000
- Adds decimals to the hundredths place (same number of digits)
- Adds money with regrouping
- Adds multiple-digit numbers, with regrouping, with sums over 1000
- Adds two 3- and/or 4-digit numbers, with regrouping, with sums over 1000
- Adds two or three 2-digit number with regrouping
- Combines a collection of coins and identifies the correct notation
- Computes 1 operation on addition or subtraction real-world problems involving money up to \$5.00
- Computes with dollars and cents up to and including \$5.00 and converts to decimals (addition/subtraction only)
- Demonstrates an understanding of the inverse relationship between multiplication and division
- Determines elapsed clock time
- Determines elapsed time involving whole hours, whole days, whole years
- Determines elapsed time under 1 hour or to the hour
- Determines the operation needed from a simple problem
- Distinguishes between odd and even numbers
- Finds equivalent combinations of coins with the same value
- Identifies the correct time, given the words, and vice versa
- Identifies the number that is "1 less than" a given number
- Identifies the value of a collection of coins and bills to \$10.00 by "counting on" (with picture of money)
- Identifies the value of a collection of coins to \$1.00 (without picture of coins)
- Instantly recalls basic addition facts with sums to 18 in a table
- Instantly recalls basic multiplication facts where one factor is 6-12 and the other factor is 0-12
- Instantly recalls basic subtraction facts with minuend less than 10
- Instantly recalls division facts with dividend and divisors less than 10
- Makes change to \$1.00 by "counting on" or subtracting
- Models multiplication and division algorithms using arrays (whole numbers)
- Models whole number multiplication and division algorithms (e.g., shows multiplication as repeated addition)

and division as repeated subtraction)

- Multiplies a 2-digit number by a 1-digit number with regrouping
- Multiplies a 2-digit number by a 2-digit number with no regrouping
- Multiplies basic facts to 10 x 10 vertically
- Performs mental computation with 2, 3, or 4 addends
- Performs mental subtraction with numbers under 1000
- Recognizes addition and subtraction fact families through 18
- Solves problems using the inverse relationship between addition and subtraction
- Solves real-world whole number addition problems with sums to 100 (result unknown)
- Solves real-world whole number addition problems with sums to 20 (result unknown) - with extraneous information given
- Solves real-world whole number problems involving addition and subtraction
- Solves real-world whole number problems involving subtraction with numbers 100 and under
- Solves real-world whole number problems involving subtraction with numbers under 20
- Solves word problems involving basic whole number multiplication facts to 10 x 10
- Subtracts 2- and/or 3-digit numbers with no regrouping
- Subtracts 3- or 4-digit numbers with regrouping
- Subtracts a 2-digit number from a 2-digit number, with regrouping
- Subtracts multiple-digit numbers with no regrouping
- Tells time to the nearest 5 minutes
- Uses counting by multiples for multiplication
- Uses manipulatives to divide a small set of objects into groups of equal size
- Uses models to calculate differences through 100 (whole numbers)
- Uses rounding to estimate answers to real-world problems involving addition of numbers less than 100 (whole numbers only)
- Uses sharing for division
- Uses strategies for sums and differences with 2-digit numbers (e.g., decomposing, compatible, compensation, partial sums, counting on)

Students:

RIT 171-180:

- Adds 1- and/or 2-digit numbers with sums under 100
- Adds 1-digit numbers with sums to 18 (with parentheses)
- Adds 3-digit numbers with no regrouping
- Adds 3-digit numbers, with regrouping, with sums under 1000
- Adds two or three 2-digit number with regrouping
- Connects money with place value
- Determines the operation needed from a simple problem
- Identifies the value of a collection of coins and bills to \$10.00 by "counting on" (with picture of money)
- Identifies the value of a collection of coins to \$1.00 (with pictures of coins)
- Instantly recalls basic multiplication facts where one factor is 0-5 and the other factor is 0-12
- Multiplies basic facts to 10 x 10 vertically
- Recognizes addition and subtraction fact families through 18
- Solves real-world whole number addition problems with sums to 100 (result unknown)
- Solves real-world whole number addition problems with sums to 20 (result unknown)
- Solves real-world whole number addition problems with sums to 20 (start unknown)
- Solves real-world whole number problems involving subtraction with numbers under 20
- Subtracts 2- and/or 3-digit numbers with no regrouping
- Subtracts a 1-digit number from a 2-digit number that is less than 20 (whole numbers only)
- Subtracts a 1-digit number from a 2-digit number with no regrouping, vertically
- Subtracts a 2-digit number from a 2-digit number, with no regrouping
- Tells time to the nearest 5 minutes
- Tells time to the nearest half hour
- Tells time to the nearest hour
- Uses a number line to construct addition facts with sums through 20 (whole numbers)
- Uses models to calculate whole number sums through 999
- Uses strategies for addition facts (e.g., compatible numbers, counting on, doubles, neighbors, making tens)

Students:

RIT 161-170:

- Adds 1-digit to multiple-digit number with no regrouping
- Adds 1-digit to multiple-digit number with regrouping
- Adds 2-digit numbers with no regrouping
- Adds multiple 1-digit numbers
- Adds two 1-digit numbers with sums between 10 and 19 in horizontal format

- Adds two 1-digit numbers with sums between 10 and 19 in vertical format
- Adds two 1-digit numbers with sums to 10 in horizontal format
- Instantly recalls basic multiplication facts where one factor is 0-5 and the other factor is 0-12
- Solves real-world whole number addition problems with sums to 20 (result unknown)
- Subtracts a 1-digit number from a 2-digit number that is less than 20 (whole numbers only)
- Subtracts a 2-digit number from a 2-digit number, with no regrouping
- Subtracts two 1-digit numbers horizontally
- Subtracts two 1-digit numbers vertically
- Tells time to the nearest half hour
- Tells time to the nearest hour
- Uses a number line to construct addition facts with sums through 20 (whole numbers)
- Uses models to calculate whole number sums through 99
- Uses strategies for addition facts (e.g., compatible numbers, counting on, doubles, neighbors, making tens)

Students:

RIT Below 161:

- Adds 1-digit to multiple-digit number with no regrouping
- Adds 1-digit to multiple-digit number with regrouping
- Adds two 1-digit numbers with sums to 10 in horizontal format
- Uses models to calculate whole number sums through 99
- Uses models to construct whole number addition facts with addends through 10