DesCartes: A Continuum of Learning®

Mathematics

Goal: The Real and Complex Number Systems

RIT Score Range: 231 - 240
Statements Last Updated: Mar 10, 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
Ratios and Proportional Relationships	Ratios and Proportional Relationships	Ratios and Proportional Relationships
• Solves real-world problems involving decimals (not money) using multiplication • Solves problems involving ratios • Solves 1-step problems involving proportions • Calculates basic percents of a number (e.g., 10%, 20%, 25%, 50%, 100%) • Calculates a percent of a number (e.g., 6% of 30) • Calculates a number from a percent (e.g., 4 is 9% of what) • Solves problems involving percents • Solves problems involving tax and tips • Converts between inches, feet, and yards • Converts between millimeters, centimeters, meters, and kilometers • Uses dimensional analysis for unit conversions (length) • Solves problems involving length in the customary system and converts to larger or smaller units • Converts between ounces and pounds • Converts between ounces, pounds, and tons • Converts between cups, pints, quarts, and gallons • Converts within the metric system • Apply dimensional analysis to simple real-world problems (capacity) • Solves problems involving capacity in the customary system and converts to larger or smaller units • Computes 2-step conversions between units of time • Applies dimensional analysis to simple real-world problems (time) • Solves complex problems involving miles per gallon • Solves complex problems involving miles/kilometers per hour • Solves problems involving rates • Solves problems involving perimeter and converts to larger or smaller units • Interprets data given in circle graphs to solve complex problems (with percents) • Expresses a percent as a fraction and vice versa • Writes a ratio as a percent and vice versa • Uses concrete and pictorial models to represent ratios • Writes the missing number in a proportion with numbers other than basic facts (e.g., 5/13=?/117)	• Uses estimation to solve problems involving proportional reasoning (decimals only) • Solves real-world problems involving decimals (not money) using multiplication • Solves problems involving equivalent fractions (analysis) • Solves problems involving ratios • Solves multiple-step problems involving proportions • Calculates a percent of a number (e.g., 6% of 30) • Calculates the percent one number is of another (e.g., 20 is what % of 90) • Solves problems involving percents • Solves problems involving percents (analysis) • Solves problems involving simple percent discounts (e.g., finding sale price) • Solves problems involving percent increase and decrease • Solves problems involving tax and tips • Calculates commission/deductions and total pay • Converts between millimeters, centimeters, meters, and kilometers • Uses dimensional analysis for unit conversions (length) • Converts between the customary and metric system given conversion ratios (2-step, length) • Apply dimensional analysis to simple real-world problems (length) • Solves problems involving length in the customary system and converts to larger or smaller units • Converts between grams and kilograms • Solves problems involving weight in the customary system and converts to larger or smaller units • Converts within the metric system • Apply dimensional analysis to simple real-world problems (capacity) • Solves problems involving capacity in the customary system and converts to larger or smaller units • Solves complex problems involving miles per gallon • Solves problems comparing unit prices • Solves problems involving rates • Interprets data given in circle graphs to solve complex problems (with percents) • Expresses a percent as a fraction and vice versa • Writes a ratio as a percent and vice versa • Identifies the ratio from a given real-world situation	• Solves real-world problems involving decimals (not money) using multiplication • Solves multiple-step problems involving proportions • Solves problems involving a fractional increase • Calculates the percent one number is of another (e.g., 20 is what % of 90) • Calculates a percent of a rational number (e.g., 6% of 0.78) • Solves problems involving percents (analysis) • Solves problems involving simple percent discounts (e.g., finding sale price) • Solves problems involving complex percent discounts (e.g., finding percent discount, regular price) • Calculates commission/deductions and total pay • Solves problems involving successive discounts • Uses dimensional analysis for unit conversions (length) • Apply dimensional analysis to simple real-world problems (length) • Solves problems involving weight in the customary system and converts to larger or smaller units • Uses dimensional analysis for unit conversions (time) • Solves problems involving rate conversions (e.g., mi/hr to ft/sec) • Identifies the ratio from a given real-world situation

Explanatory Notes
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Perform Operations	Perform Operations	Perform Operations
• Uses rounding to estimate answers to real-world problems involving multiplication and division of numbers less than 100 (whole numbers only)	• Divides multiple-digit numbers	• Uses a number line to determine the distance between a positive and negative number
• Uses rounding to estimate answers to real-world problems involving numbers less than 1000 with multiplication and division (whole numbers only)	• Divides numbers by powers of 10	• Subtracts integers
• Uses rounding to estimate answers to real-world problems involving numbers 1000 or greater using multiplication and division (whole numbers only)	• Adds fractions with unlike denominators with reducing or converting to a mixed fraction	• Uses the multiplicative inverse property with rational numbers
• Multiplies multiple-digit numbers	• Adds simple mixed fractions with unlike denominators (e.g., halves, thirds, fourths, eighths)	• Uses factor and multiple concepts to solve difficult problems
• Divides a 4-digit number by a 2-digit number	• Adds mixed fractions where converting from improper fractions is necessary	• Identifies the least common multiple of whole numbers
• Divides multiple-digit numbers	• Subtracts whole numbers, fractions, and mixed fractions	
• Solves complex word problems involving whole number division with remainder (e.g., 2-step, 2-digit divisor)	• Subtracts whole numbers, fractions, and mixed fractions with regrouping	
• Solves real-world multiple-step problems involving whole numbers	• Solves real-world problems involving addition and subtraction of fractions where converting both denominators is necessary	
• Demonstrates an understanding of multiple properties	• Uses models to multiply and divide fractions and connect the actions to algorithms	
• Adds fractions with like denominators with reducing or converting to a mixed fraction	• Multiplies mixed fractions	
• Adds fractions with unlike denominators without reducing	• Uses models to multiply and divide fractions and mixed fractions and connect the actions to algorithms	
• Adds fractions with unlike denominators with reducing or converting to a mixed fraction	• Divides a fraction by a fraction	
• Adds simple mixed fractions with unlike denominators (e.g., halves, thirds, fourths, eighths)	• Divides a fraction by a whole number	
• Adds mixed fractions where converting from improper fractions is necessary	• Divides a whole number by a fraction	
• Subtracts fractions with like denominators with reducing	• Divides a mixed fraction by a whole number	
• Subtracts fractions with unlike denominators without reducing	• Divides a whole number by a mixed fraction	
• Subtracts fractions with unlike denominators with reducing	• Divides a mixed fraction by a fraction	
• Subtracts mixed fractions with unlike denominators with no regrouping	• Divides a fraction by a mixed fraction	
• Subtracts whole numbers, fractions, and mixed fractions	• Divides a mixed fraction by a mixed fraction	
• Subtracts whole numbers, fractions, and mixed fractions with regrouping	• Solves 2- or more step real-world problems involving fractions with multiplication and division	
• Solves real-world problems involving addition and subtraction of fractions where converting one denominator is necessary	• Solves problems involving fractions (e.g., multiple operations, conversions)	
• Uses models to multiply and divide fractions and connect the actions to algorithms	• Subtracts a decimal from a whole number, horizontally	
• Multiplies a fraction by a fraction without reducing to simplest form (complex problem)	• Multiplies a decimal by 10, 100, 1000	
• Multiplies a fraction by a fraction where reducing to simplest form is necessary	• Divides a whole number by a decimal	
• Multiplies a fraction by a whole number	• Divides a decimal by 10, 100, 1000	
	• Divides a decimal by a decimal	
	• Adds integers with unlike signs	
	• Adds several positive and negative integers	
	• Subtracts integers	
	• Solves problems involving addition and subtraction of integers	

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Perform Operations	Perform Operations	Perform Operations
• Multiplies mixed fractions • Divides a fraction by a fraction • Divides a mixed fraction by a fraction • 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 problems involving fractions (e.g., multiple operations, conversions) • Adds decimals to the hundredths place in horizontal format (not same number of digits) • Adds decimals through the hundred-thousandths place • Subtracts decimals to the hundredths place (not same number of digits) • Subtracts decimals to the thousandths place, horizontally, with and without regrouping • Subtracts decimals through the hundred-thousandths place, horizontally • Subtracts a decimal from a whole number, horizontally • Multiplies a decimal by a decimal, vertical form (factors to tenths or hundredths) • Multiplies a decimal by a decimal (factors to hundredths) • Multiplies a decimal by 10, 100, 1000 • Multiplies a decimal by a decimal (factors to thousandths) • Divides a decimal by 10, 100, 1000 • Divides a decimal by a decimal • Computes with dollars and cents over $5.00 and converts to decimals (multiplication/division) • Computes the value of multiple bills and coins (multiplication/division) • Calculate the sum of integers using a number line • Adds integers with unlike signs • Adds several positive and negative integers • Uses models to add and subtract integers and connect the actions to algorithms • Subtracts integers • Solves real-world problems involving addition and subtraction of integers • Solves problems involving addition and subtraction of integers • Multiplies integers with unlike signs • Divides integers with unlike signs	• Multiplies integers with like signs • Divides integers with like signs • Subtracts rational expressions in decimal form • Multiplies rational expressions • Identifies the additive inverse property • Interprets data given in tables to solve problems • Writes a fraction as a decimal and vice versa • Writes a fraction as a mixed decimal and vice versa	

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Perform Operations	**Perform Operations**	**Perform Operations**
• Divides integers with like signs • Adds rational expressions in decimal form • Identifies the additive inverse property • Solves difficult problems involving elapsed time, with the conversion of hours • Interprets data given in tables to solve problems • Writes a simple mixed fraction as a decimal and vice versa • Writes a fraction or mixed number as a decimal when the denominator is a multiple of 10 • Determines factors of whole numbers • Uses multiple number theory concepts to solve problems (e.g., factors, digits, odd/even, divisibility) • Uses factor and multiple concepts to solve simple problems • Identifies common factors of two or more numbers • Identifies the greatest common factor of whole numbers		
Extend and Use Properties	**Extend and Use Properties**	**Extend and Use Properties**
• Graphs ordered pairs in all quadrants • Computes and interprets distance, given a set of ordered pairs (horizontal and vertical lines) • Determines the relative magnitude of whole numbers • Rounds whole numbers to the nearest million • Writes equivalent forms of whole numbers using place value (numbers 100 or greater) (e.g., 253 = 2 hundreds, 5 tens, and 3 ones) • Writes whole numbers in standard and exponential form • Identifies a fractions in lowest terms from a region or set • Determines simple equivalent fractions using multiples • Determines equivalent fractions using multiples • Compares fractions (e.g., comparing numerators and denominators) • Uses alternative algorithms to explain the meaning of fraction • Represents a decimal to thousandths place (e.g., three thousandths = 0.003) • Represents a decimal to the hundred thousandths place - (e.g., three hundred thousandths = 0. 00003) • Writes a decimal for a shaded region to the hundredths place • Compares and orders decimals to the hundredths place (not same number of digits after decimal) • Compares and orders decimals to the thousandths place (not same number of digits after decimal) • Compares and orders decimals past the thousandths place	• Simplifies rational expressions with absolute value • Graphs ordered pairs in all quadrants • Computes and interprets distance, given a set of ordered pairs (horizontal and vertical lines) • Determines the relative magnitude of whole numbers • Writes whole numbers in standard and exponential form • Compares fractions (e.g., comparing numerators and denominators) • Rounds decimals to the nearest hundredth • Compares and orders decimal and fractional coordinates on a number line	• Estimates the square roots of numbers • Simplifies expressions containing square roots • Uses expressions with absolute value to represent situations • Computes and interprets distance, given a set of ordered pairs (horizontal and vertical lines)

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Extend and Use Properties	Extend and Use Properties	Extend and Use Properties
• Rounds decimals to the nearest hundredth • Rounds decimals to nearest thousandth • Identifies the place value and value of each digit to the hundredths and thousandths • Applies base ten place value concepts to solve problems using decimals • Compares two integers • Orders integers on a number line • Orders integers • Locates rational numbers on a number line • Orders rational numbers, in a/b form • Orders fractions and decimals to the hundred thousandths		
New Vocabulary: real number, ten million	*New Vocabulary:* discount, equality	*New Vocabulary:* feet per second, least common multiple
New Signs and Symbols: ( ) parenthesis around an integer, cm centimeter/centimetre, °C degrees Celsius, km kilometer/kilometre, mL milliliter/millilitre, # number, / per, + positive number, : ratio	*New Signs and Symbols:* || absolute value, oz ounce	*New Signs and Symbols:* LCM lowest common multiple, sec second, square root symbol

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