ipdae INSTITUTE FOR THE PROFESSIONAL DEVELOPMENT OF ADULT EDUCATORS

Adult Basic Education Mathematics Curriculum Matrix

Domain	NRS Level 1		NRS Level 2				NRS Level 3				NRS Level 4				NRS Level 5/6			
1. Number and Operations: Base Ten	Place Value of 2-Digit Numbers	Add and Subtract 2-Digit Numbers	Place Value of 3-Digit Numbers	Add and Subtract 3-Digit Numbers	Round Whole Numbers to the Nearest Tens or	Use Properties of Operations to Perform Multi-Digit	Generalize Understanding of Place Value	Read and Write Multi-Digit Numbers in Names and	Multiply 4-Digit Numbers by 1- to 2-Digit Numbers	Use Place Value to Understand Decimals								
	Compare 2-Digit Numbers	Model Addition and Subtraction of 2-Digit Numbers	Compare 3-Digit Numbers	Model Addition and Subtraction of 3-Digit Numbers	Multiply 1-Digit Numbers By 2-Digit Multiples of 10	Mentally Add and Subtract 10 or 100 to 3-Digit Numbers	Compare Any Multi-Digit Number	Round Multi-Digit Numbers to Any Place Value	Divide 4-Digit Numbers by 1-Digit Numbers	Read, Write, and Compare Decimals to Thousandths								
							Basic Operations with Multi-Digit Numbers in Standard Algorithm	Perform Basic Operations on Decimal Numbers Using Multiple	Round Decimals to Any Place	Divide 4-Digit Numbers by 2-Digit Numbers Using Multiple Strategies								
2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20	The Equal Sign	Solve Addition and Subtraction Problems within 100	Solve Multiplication and Division Problems within 100	Multiplication Facts within 100	Solve 2-Step Problems or Equations	Solve Multi-Step Problems Using Basic Operations	Interpret Multiplication as Comparison	Interpret the Remainder in Problems	Multiples of 1-Digit Numbers Up to 100					Identify Parts of an Expression	Use Factoring Techniques to Rewite Expressions	Find Zeros of Quadratic Functions	
	Commutative and Associative Property of Addition	Solving Addition and Subtraction Equations	Commutative and Associative Property of Multiplication	Solve Multiplication and Division Equations	Distributive Property of Multiplication	Model Multiplication and Division within 100	Check Answers Using Mental Computation and Estimation	Solve Problems Involving Multiplicative Comparisons	Find All Factor Pairs of Any 2-Digit Whole Number	Prime and Composite Numbers within 100					Perform the Four Basic Operations on Polynomials	Use Constraints to Evaluate Viability of Algebraic Models of Real-World Situations	Manipulate Formulas to Isolate Quantity of Interest	
							Write and Interpret Numerical Expressions	Interpret Expressions without Evaluating Them	Generate and Analyze Numeric and Geometric Patterns	Identify Inexplicit Features of a Pattern from a Rule					Explain Steps in Solving Equations	Construct Viable Arguments to Justify Solution Method	Represent Real-World Problem Constraints Using Equations or Inequalities	Represent Real-World Problem Constraints Using Systems of Equations or Inequalities
3. Measurement and Data	Organize, Represent, and Interpret 3 Categories of Data	Indirectly Measure Lengths through Iteration	Analyze and Generate Picture Graphs and Bar Graphs	Analyze and Generate Line Plots	Measure and Estimate Lengths in Standard Units	Solve Problems Involving Time, Volume and Mass	Solve Problems in Length, Time, Volume, Mass and Money Including Fractions	Solve Problems in Length, Time, Volume, Mass and Money Including Decimals	Solve Problems Involving Information Presented in Line Plots	Recognize Angles					Use Dimensional Analysis to Solve Multi-Step Problems	Interpreting Scales in Graphs and Data Displays	Use Measurement Limitations to Adjust Level of Accuracy when Reporting Quantities	
			Represent Whole Number Lengths on a Number Line	Measuring and Estimating Areas of Plane Figures	Solve Problems Involving Perimeter of Polygons	Use Areas to Model Addition and Multiplication	Apply Area and Perimeter Formulas for Rectangles	Convert Measurements within a System	Organize Unit Fraction Data (1/2, 1/4, 1/8) in a Line Plot	Understand Concepts of Angle Measurement					Analyze and Interpret Units Consistently in Formulas	Interpret the Origin in Graphs and Data Displays		
							Measure and Sketch Angles in Whole-Number Degrees	Solve Addition and Subtraction Problems for Unknown Angles										
4. Geometry	Analyze, Compare, and Compose 3-Dimensional Shapes	2- and 3-Dimensional Composite Shapes	Analyze, Draw and Compare Shapes Having Specified Attributes	Identify Common Polygons and 3-Dimensional Figures	Categorize Shapes with Common Attributes	Partition Shapes into Parts with Equal Areas	Draw and Identify Points, Lines, Line segments, and Rays	Solve Problems by Graphing Points on the Coordinate Plane	Solve Problems Involving Area, Surface Area, and Volume	Draw Polygons in a Coordinate Plane	Solve Problems Involving Scale Drawings of Geometric Figures	Produce Congruence and Similarity Using Models	Angle Sum and Exterior Angles of Triangles and Transversals		Define Angles, Circles, Perpendicular Lines, Parallel Lines and Line Segments	Prove Theorems Involving Similarity of Triangles	Use Congruence and Similarity Criteria for Triangles to Solve Problems	Prove Relationships in Geometric Figures
							Draw and Identify Angles, Perpendicular and Parallel Lines	Classify 2-Dimensional Figures into Categories Based on Properties	Find Areas of Polygons by Composing or Decomposing	Find the Length of a Side with the Same First or Second Coordinate	Solve Problems Involving Angle Meas., Areas, SA and Volume	Recognize Congruence and Similarity from Transformations	Explain and Apply the Pythagorean Theorem		Use the Volume Formula for Cylinders to Solve Problems	Use the Volume Formula for Pyramids to Solve Problems	Use the Volume Formula for Cones to Solve Problems	Use the Volume Formula for Spheres to Solve Problems
							Represent 3-Dimensional Figures Using Nets	Use Nets to Find the Surface Area of Figures							Apply the Concept of Density Based on Area and Volume in Modeling Situations			
5. Number and Operations: Fractions			Represent Fractions with Denominators 2, 3, 4, 6, or 8 on a Number Line	Recognize Equivalent Fractions on a Number Line	Use Visual Models to Represent Equivalent Fractions	Compare Fractions with the Same Numerator or Denominator	Generate Equivalent Fractions	Compare Fractions Using Common Numerators or Denominators	Decompose Fractions as Sum of Fractions with the same Denominator	Decompose Fractions as Multiples of Unit Fractions								
							Use Models to Illustrate Equivalent Fractions	Compare Fractions Using Benchmark Fractions Such as 1/2	Add and Subtract Mixed Numbers Using Equivalent Fractions	Multiply Fractions by a Whole Number								
							Multiply and Divide Fractions	Solve Problems Involving Multiplication and Division of Fractions	Convert Fractions with Denominators 10 or 100 to Decimals	Solve Problems Involving Addition and Subtraction of Fractions								
6. Expressions and Equations							Write and Evaluate Algebraic Expressions with Exponents	Identify and Generate Equivalent Algebraic Expressions	Use Substitution to Determine If an Equation or Inequality is True	Express One Quantity as the Dependent Variable of the Another	Add, Subtract, Factor, and Expand Linear Expressions	Construct Equations and Inequalities to Solve Problems	Apply the Properties of Exponents to Generate Equivalent Expressions	Solve Problems Involving Quantities in Scientific Notation	Rewrite Rational Expressions Using Various Techniques	Solve Quadratic Equations in One Variable	Solve Systems of Linear Equations Graphically and Algebraically	Graph Equations in Two Variables
							Perform the Order of Operations on Algebraic Expressions	Reason and Solve One-Variable Equations and Inequalities	Use Variables to Represent Two Related Quantities in a Problem	Use Graphs, Tables and Equations to Show Variable Relationships	Rewrite Expressions to Show Relationships Between Quantities	Solve Problems Using Algebraic Equations with Rational Coefficients	Evaluate Square and Cube Roots of Perfect Squares and Cubes	Graph Proportional Relationships - Unit Rate as the Slope	Write Equations and Inequalities in One Variable to Solve Problems	Write Equations in Two or More Variables to Represent Relationships in Quantities	Graph Equations with Labels and Scales	
											Solve Simultaneous Linear Equations in One Variable				Simple Rational and Radical Equations in One Variable	Simple Rational and Radical Equations with Extraneous Solutions	Solve Linear Equations and Inequalities with Letter Coefficients	

	7. The Number System							Fluently Divide Multi-Digit Numbers	Fluently Add, Subtract, Multiply and Divide Multi-Digit Decimals	Find the Greatest Common Factor of Two Numbers ≤ 100	Apply Distributive Property to Generate Equivalent Expressions	Use Integers to Represent Quantities in Real-World Contexts	Plot/Find Ordered Pairs of Rational Numbers on a Coordinate Plane	Explain Statements of Order and Inequality Using a Number Line	Add and Subtract Rational Numbers Using a Number Line	Transforming Radical Expressions to Exponential Expressions			
								Find the Least Common Multiple of Two Numbers ≤ 12	Use Models to Illustrate, Interpret and Compute Quotients of Fractions	Solve Problems Involving Division of Fractions by Fractions		Plot/Find Rational Numbers on a Number Line	Understand and Evaluate Absolute Value of Rational Numbers	Solve Problems by Graphing	Multiply and Divide Rational Numbers	Transforming Expressions with Rational Exponents to Radical Expressions			
												Convert a Rational Number to Decimal	Solve Problems Involving Basic Operations on Rational Numbers	Find Rational Approximations of Irrational Numbers	Estimate the Location of Irrational Numbers on a Number Line				
	8. Ratios and Proportional Relationships							Describe a Relationship Between Two Quantities Using a Ratio				Explain the Unit Rate a/b Associated with the Ratio a:b, with b ≠ 0	Use Various Techniques to Solve Problems Involving Ratios	Represent Proportional Relationships by Equations and Graphs	Solve Problems Involving Proportional Relationships				
	9. Statistics and Probability							Discuss Statistical Questions Involving Variability in Data	Discuss Statistical Questions Involving Center, Spread and Overall Shape	Discuss the Measure of Center and Variation for a Numerical Data Set	Display Numerical Data in Plots on a Number Line: Dot Plots, Histograms, Box Plots	Relate Measures of Center and Variability to Data Distribution and Context	Draw Informal Comparative Inferences About Two Populations	Find or Approximate the Probability of Simple & Compound Events with Various Techniques	Construct and Interpret Scatter Plots from Two-Way Tables and Vice Versa	Represent Data Using Dot Plots	Represent Data Using Histograms	Represent Data Using Box Plots	Interpret Differences in Shape, Center and Spread in the Context of Data Sets
												Summarize and Describe Numerical Data Sets	Use Interquartile Range and MAD to Draw Comparative Inferences	Use Random Sampling to Draw Inferences About a Population	Use the Equation of a Linear Model to Solve Problems	Summarize Data Using Two-Way Frequency Tables	Interpret Relative Frequencies in the Context of Data (Joint, Marginal and Conditional)	Recognize Possible Associations and Trends in the Data	Interpret the Slope and the Intercept of a Linear Model
																Interpret Effects of Extreme Data Points to Shape, Center and Spread of Data Sets	Distinguish Between Correlation and Causation		
	10. Functions											Define, Evaluate and Compare Functions	Interpret the Equation y = mx + b as Defining a Linear Function	Construct a Function to Model Linear Relationships	Describe Qualitatively or Sketch the Functional Relationship Between Two Quantities	Definition of a Function	Identify the Domain and Range of a Function	Write Functions Using Function Notation	Evaluate Functions
																Calculate and Interpret the Average Rate of Change of a Function Over an Interval	Estimate the Rate of Change of a Function from Its Graph Over a Specified Interval	Graph the Equation of a Functions by Hand and by Using Technology	Identify Key Features of a Graph of a Function
																Write the Equation of a Function Decribing the Relationship of Two Quantities	Interpret Key Feature of Graphs and Tables of Functions	Sketch the Graph of a Function Given a Verbal Description of Relationship of Quantities	Relate the Domain of a Function to the Real-World Quantity It Represents
																Recognize Linear Functions	Recognize Exponential Functions as Growth or Decay	Interpret Parameters in Linear or Exponential Functions in Terms of	Interpret Function Notations in Terms of the Context They Describe
																Interpret Exponential Functions Using Properties of Exponents (e.g. Growth or Decay)	Compare Functions Each Represented in a Different Way (Graph, Equation, Table, etc.)		