THE MATH TRANSLATOR

PREALGEBRA
VIDEO LIBRARY OUTLINE

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VIDEO LIBRARY OVERVIEW

Chapter 1 – Whole Numbers
- 1.1   Introduction to Whole Numbers
- 1.2   Add Whole Numbers
- 1.3   Subtract Whole Numbers
- 1.4   Multiply Whole Numbers
- 1.5   Divide Whole Numbers

Chapter 2 – The Language of Algebra
- 2.1   Use the Language of Algebra
- 2.2   Evaluate, Simplify, and Translate Expressions
- 2.3   Solving Equations Using the Subtraction and Addition Properties of Equality
- 2.4   Find Multiples and Factors
- 2.5   Prime Factorization and the Least Common Multiple (LCM)

Chapter 3 – Integers
- 3.1   Introduction to Integers
- 3.2   Add Integers
- 3.3   Subtract Integers
- 3.4   Multiply and Divide Integers
- 3.5   Solve Equations Using Integers; The Division Property of Equality

Chapter 4 – Fractions
- 4.1   Visualize Fractions
- 4.2   Multiply and Divide Fractions
- 4.3   Multiply and Divide Mixed Numbers and Complex Fractions
- 4.4   Add and Subtract Fractions with Common Denominators
- 4.5   Add and Subtract Fractions with Different Denominators
- 4.6   Add and Subtract Mixed Numbers
- 4.7   Solve Equations with Fractions

Chapter 5 – Decimals
- 5.1   Decimals
- 5.2   Decimal Operations
- 5.3   Decimals and Fractions
- 5.4   Solve Equations with Decimals
- 5.5   Averages and Probability
- 5.6   Ratios and Rate
- 5.7   Simplify and Use Square Roots

CHAPTER 1 – WHOLE NUMBERS

1.1   Introduction to Whole Numbers
Topics:
A. Identify counting numbers and whole numbers (1 – 7 odd)
B. Identify the place value of a digit (9 – 11 odd)
C. Use place value to name whole numbers (13 – 29 odd)
D. Use place value to write whole numbers (31 – 41 odd)
E. Round whole numbers (43 – 49 odd)
Suggested Homework Exercises: 1 – 49 odd

1.2   Add Whole Numbers
Topics:
A. Use addition notation (59 – 63 odd)
B. Add whole numbers without models (65 – 105 odd)
C. Translate word phrases to math notation (107 – 117 odd)
D. Add whole numbers in applications (119 – 133 odd)
Suggested Homework Exercises: 59 – 133 odd

1.3   Subtract Whole Numbers
Topics:
A. Use subtraction notation (141 – 145 odd)
B. Subtract whole numbers (147 – 181 odd)
C. Translate word phrases to math notation (183 – 211 odd)
D. Subtract whole numbers in applications (213 – 219 odd)
Suggested Homework Exercises: 141 – 219 odd

1.4   Multiply Whole Numbers
Topics:
A. Use multiplication notation (225 – 235 odd)
B. Multiply whole numbers (237 – 287 odd)
C. Translate word phrases to math notation (289 – 321 odd)
D. Multiply whole numbers in applications (323 – 337 odd)
Suggested Homework Exercises: 225 – 337 odd

1.5   Divide Whole Numbers
Topics:
A. Use division notation (343 – 357odd)
B. Divide whole numbers (359 – 421 odd)
C. Translate word phrases to math notation (423 – 433 odd)
D. Divide whole numbers in applications (435 – 439 odd)
Suggested Homework Exercises: 343 – 439 odd

CHAPTER 2 – THE LANGUAGE OF ALGEBRA

2.1   Use the Language of Algebra
Topics:
A. Use variables and algebraic symbols (1 – 21 odd)
B. Identify expressions and equations (23 – 29 odd)
C. Simplify expressions with exponents (31 – 37 odd)
D. Simplify expressions using order of operations (39 – 63 odd)
Suggested Homework Exercises: 1 – 63 odd

2.2   Evaluate, Simplify, and Translate Expressions
Topics:
A. Evaluate algebraic expressions (69 – 87 odd)
B. Identify terms, coefficients, and like terms (89 – 99 odd)
C. Simplify expressions by combining like terms (101 – 115 odd)
D. Translate word phrases to algebraic expressions (117 – 141 odd)
Suggested Homework Exercises: 69 – 141 odd

2.3   Solving Equations Using the Subtraction and Addition Properties of Equality
Topics:
A. Determine whether a number is a solution of an equation (147 – 161 odd)
B. Solve equations using the Addition and Subtraction Properties of Equality
   (163 – 185 odd)
C. Translate word phrases to algebraic equations (187 – 197 odd)
D. Translate to an equation and solve (199 – 207 odd)
Suggested Homework Exercises: 147 – 207 odd

2.4   Find Multiples and Factors
Topics:
A. Identify multiples of numbers (215 – 223 odd)
B. Use common divisibility tests (225 – 241 odd)
C. Find all of the factors of a number (243 – 249 odd)
D. Identify prime and composite numbers (251 – 261 odd)
Suggested Homework Exercises: 215 – 261 odd

2.5   Prime Factorization and the Least Common Multiple (LCM)
Topics:
A. Find the prime factorization of a composite number (267 – 293 odd)
B. Find the least common multiple (LCM) of two numbers (295 – 311 odd)
Suggested Homework Exercises: 267 – 311 odd

CHAPTER 3 – INTEGERS

3.1   Introduction to Integers
Topics:
A. Locate positive and negative numbers on a number line (1 – 3 odd)
B. Order positive and negative numbers (5 – 7 odd)
C. Find opposites (9 -19 odd)
D. Simplify expressions with absolute value (21 – 41 odd)
E. Translate word phrases to expressions with integers (43 – 55 odd)
Suggested Homework Exercises: 1 – 55 odd

3.2   Add Integers
Topics:
A. Model addition of integers (63 – 69 odd)
B. Simplify expressions with integers (71 – 85 odd)
C. Evaluate variable expressions with integers (87 – 101 odd)
D. Translate word phrases to algebraic expressions (103 – 111 odd)
E. Add integers in applications (113 – 121 odd)
Suggested Homework Exercises: 63 – 121 odd

3.3   Subtract Integers
Topics:
A. Model subtraction of integers (127 – 133 odd)
B. Simplify expressions with integers (135 – 177 odd)
C. Evaluate variable expressions with integers (179 – 185 odd)
D. Translate word phrases to algebraic expressions (187 – 193 odd)
E. Subtract integers in applications (195 – 205 odd)
Suggested Homework Exercises: 127 – 205 odd

3.4   Multiply and Divide Integers
Topics:
A. Multiply integers (211 – 221 odd)
B. Divide integers (223 – 231 odd)
C. Simplify expressions with integers (233 – 257 odd)
D. Evaluate variable expressions with integers (259 – 269 odd)
E. Translate word phrases to algebraic expressions (271 – 277 odd)
Suggested Homework Exercises: 211 – 277 odd

3.5 **Solve Equations Using Integers; The Division Property of Equality**
Topics:
A. Determine whether an integer is a solution of an equation (285 – 287 odd)
B. Solve equations with integers using the Addition and Subtraction Properties of Equality (289 – 303 odd)
C. Solve equations using the Division Property of Equality (305 – 315 odd)
D. Translate to an equation and solve (317 – 345 odd)
Suggested Homework Exercises: 285 – 345 odd

CHAPTER 4 – FRACTIONS

4.1 **Visualize Fractions**
Topics:
A. Understand the meaning of fractions (1 – 27 odd)
B. Convert between improper fractions and mixed numbers (29 – 43 odd)
C. Find equivalent fractions (45 – 55 odd)
D. Locate fractions and mixed numbers on the number line (57 – 63 odd)
E. Order fractions and mixed numbers (65 – 71 odd)
Suggested Homework Exercises: 1 – 71 odd

4.2 **Multiply and Divide Fractions**
Topics:
A. Simplify fractions (77 – 93 odd)
B. Multiply fractions (95 – 125 odd)
C. Find reciprocals (127 – 137 odd)
D. Divide fractions 139 – 167 odd)
Suggested Homework Exercises: 77 – 167 odd

4.3 **Multiply and Divide Mixed Numbers and Complex Fractions**
Topics:
A. Multiply and divide mixed numbers (177 – 191 odd)
B. Translate phrases to expressions with fractions (193 – 197 odd)
C. Simplify complex fractions (199 – 213 odd)
D. Simplify expressions written with a fraction bar (215 – 247 odd)
Suggested Homework Exercises: 177 – 247 odd

4.4 **Add and Subtract Fractions with Common Denominators**
Topics:
A. Add fractions with a common denominator (255 – 277 odd)
B. Subtract fractions with a common denominator (279 – 303 odd)
C. Mixed Practice (305 – 311 odd)
Suggested Homework Exercises: 255 – 311 odd

4.5   Add and Subtract Fractions with Different Denominators (Part 1)
Topics:
A. Find the least common denominator (LCD) (317 – 325 odd)
B. Convert fractions to equivalent fractions with the LCD (327 – 333 odd)
C. Add and subtract fractions with different denominators (335 – 369 odd)
Suggested Homework Exercises: 317 – 369 odd

4.5   Add and Subtract Fractions with Different Denominators (Part 2)
Topics:
D. Identify and use fraction operations (371 – 389 odd)
E. Use the order of operations to simplify complex fractions (391 – 401 odd)
F. Evaluate variable expressions with fractions (403 – 431 odd)
Suggested Homework Exercises: 371 – 431 odd

4.6   Add and Subtract Mixed Numbers
Topics:
A. Add and subtract mixed numbers with a common denominator (437 – 457 odd)
B. Add and subtract mixed numbers with different denominators (459 – 489 odd)
Suggested Homework Exercises: 437 – 489 odd

4.7   Solve Equations with Fractions
Topics:
A. Determine whether a fraction is a solution of an equation(499 – 501 odd)
B. Solve equations with fractions using the Addition and Subtraction Properties of
     Equality (503 – 513 odd)
C. Solve equations with fractions using the Division and Multiplication Properties of
     Equality (515 – 549 odd)
D. Translate sentenced to equations and solve (551 – 569 odd)
Suggested Homework Exercises: 499 – 569 odd

CHAPTER 5 – DECIMALS

5.1   Decimals
Topics:
A. Name Decimals (1 – 11 odd)
B. Write decimals (13 – 25 odd)
C. Convert decimals to fractions or mixed numbers (27 – 49 odd)
D. Locate decimals on the number line (51 – 57 odd)
E. Order decimals (59 – 69 odd)
F. Round decimals (71 – 85 odd)
Suggested Homework Exercises: 1 – 85 odd

5.2 **Decimal Operations**
Topics:
A. Add and subtract decimals (95 – 121 odd)
B. Multiply decimals (123 – 141 odd)
C. Divide decimals (143 – 175 odd)
D. Use decimals in money applications (177 – 195 odd)
Suggested Homework Exercises: 95 – 195 odd

5.3 **Decimals and Fractions**
Topics:
A. Convert fractions to decimals (201 – 221 odd)
B. Order decimals and fractions (223 – 241 odd)
C. Simplify expressions using the order of operations (243 – 265 odd)
D. Find the circumference and area of circles (267 – 279 odd)
Suggested Homework Exercises: 201 – 279 odd

5.4 **Solve Equations with Decimals**
Topics:
A. Determine whether a decimal is a solution of an equation (285 – 287 odd)
B. Solve equations with decimals (289 – 323 odd)
C. Translate to an equation and solve (325 – 351 odd)
Suggested Homework Exercises: 285 – 351 odd

5.5 **Averages and Probability**
Topics:
A. Calculate the mean of a set of numbers (357 – 369 odd)
B. Find the median of a set of numbers (371 – 381 odd)
C. Find the mode of a set of numbers (383 – 389 odd)
D. Apply the basic definition of probability (391 – 397 odd)
Suggested Homework Exercises: 357 – 397 odd

5.6 **Ratios and Rate**
Topics:
A. Write a ratio as a fraction (403 – 429 odd)
B. Write a rate as a fraction (431 – 437 odd)
C. Find unit rates (439 – 453 odd)
D. Find unit price (455 – 471 odd)
E. Translate phrases to expressions with fractions (473 – 479 odd)
Suggested Homework Exercises: 403 – 479 odd

5.7 **Simplify and Use Square Roots**
Topics:
A. Simplify expressions with square roots (489 – 503 odd)
B. Estimate square roots (505 – 507 odd)
C. Approximate square roots (509 – 511 odd)
D. Simplify variable expressions with square roots (513 – 519 odd)
E. Use square roots in applications (521 – 529 odd)
Suggested Homework Exercises: 489 – 529 odd

CHAPTER 6 – PERCENTS

6.1 **Understand Percent**
Topics:
A. Use the definition of percent (1 – 7 odd)
B. Convert percents to fractions and decimals (9 – 47 odd)
C. Convert decimals and fractions to percents (49 – 85 odd)
Suggested Homework Exercises: 1 – 85 odd

6.2 **Solve General Applications of Percent**
Topics:
A. Translate and solve basic percent equations (97 – 119 odd)
B. Solve applications of percent (121 – 131 odd)
C. Find percent increase and percent decrease (133 – 143 odd)
Suggested Homework Exercises: 97 – 143 odd

6.3 **Solve Sales Tax, Commission, and Discount Applications**
Topics:
A. Solve sales tax applications (151 – 161 odd)
B. Solve commission applications (163 – 173 odd)
C. Solve discount applications (175 – 189 odd)
D. Solve mark-up applications (191 – 195 odd)
Suggested Homework Exercises: 151 – 195 odd

6.4 **Solve Simple Interest Applications**
Topics:
A. Use the simple interest formula (201 – 221 odd)
B. Solve simple interest applications (223 – 237 odd)
Suggested Homework Exercises: 201 – 237 odd

6.5 **Solve Proportions and Their Applications**
Topics:
A. Use the definition of proportions (243 – 261 odd)
B. Solve proportions (263 – 277 odd)
C. Solve applications using proportions (279 – 297 odd)
D. Write percent equations as proportions (299 – 309 odd)
E. Translate and solve percent proportions (311 – 325 odd)
Suggested Homework Exercises: 243 – 325 odd

CHAPTER 7 – THE PROPERTIES OF REAL NUMBERS

7.1 **Rational and Irrational Numbers**
Topics:
A. Identify rational numbers and irrational numbers (1 – 11 odd)
B. Classify different types of real numbers (13, 15)
Suggested Homework Exercises: 1 – 15 odd

7.2 **Commutative and Associative Properties**
Topics:
A. Use the commutative and associative properties (21 – 43 odd)
B. Evaluate expressions using the commutative and associative properties(45 – 51 odd)
C. Simplify expressions using the commutative and associative properties (53 – 85 odd)
Suggested Homework Exercises: 21 – 85 odd

7.3 **Distributive Property**
Topics:
A. Simplify expressions using the distributive property (91 – 141 odd)
B. Evaluate expressions using the distributive property (143 – 153 odd)
Suggested Homework Exercises: 91 – 153 odd

7.4 **Properties of Identity, Inverses, and Zero**
Topics:
A. Recognize the identity properties of addition and multiplication (159, 161)
B. Use the inverse properties of addition and multiplication (163 – 173 odd)
C. Use the properties of zero (175 – 185 odd)
D. Simplify expressions using the properties of identities, inverses, and zero
   (187 – 209 odd)
Suggested Homework Exercises: 159 – 209 odd

7.5 **Systems of Measurement**
Topics:
A. Perform unit conversions in the U.S. system (215 – 247 odd)
B. Perform unit conversions in the metric system (249 – 269 odd)
C. Convert between the U.S. and the metric system of measurement (271 – 281 odd)
D. Convert between Fahrenheit and Celsius temperatures (283 – 297 odd)
Suggested Homework Exercises: 215 – 297 odd

CHAPTER 8 – SOLVING LINEAR EQUATIONS

8.1 **Solve Equations Using the Subtraction and Addition Properties of Equality**
Topics:
A. Solve equations using the Subtraction and Addition Properties of Equality
    (1 – 21 odd)
B. Solve equations that need to be simplified (23 – 41 odd)
C. Translate to an equation and solve (43 – 53 odd)
D. Translate and solve applications (55 – 63 odd)
Suggested Homework Exercises: 1 – 63 odd

8.2 **Solve Equations Using the Division and Multiplication Properties of Equality**
Topics:
A. Solve equations using the Division and Multiplication Properties of Equality
    (69 – 93 odd)
B. Solve equations that need to be simplified (59 – 103 odd)
Suggested Homework Exercises: 69 – 103 odd

8.3 **Solve Equations with Variables and Constants on Both Sides**
Topics:
A. Solve an equation with constants on both sides (113 – 123 odd)
B. Solve an equation with variables on both sides (125 – 135 odd)
C. Solve an equation with variables and constants on both sides (137 – 161 odd)
D. Solve equations using a general strategy (163 – 197 odd)
Suggested Homework Exercises: 113 – 197 odd

8.4 **Solve Equations with Fraction or Decimal Coefficients**
Topics:
A. Solve equations with fraction coefficients (209 – 231 odd)
B. Solve equations with decimal coefficients (233 – 247 odd)
Suggested Homework Exercises: 209 – 247 odd

CHAPTER 9 – MATH MODELS AND GEOMETRY

9.1   Use a Problem Solving Strategy
Topics:
A. Use a problem solving strategy for word problems (1 – 13 odd)
B. Solve number problems (15 – 41 odd)
Suggested Homework Exercises: 1 – 41 odd

9.2   Solve Money Applications
Topics:
A. Solve coin word problems (51 – 63 odd)
B. Solve ticket and stamp word problems (65 – 73 odd)
Suggested Homework Exercises: 51 – 73 odd

9.3   Use Properties of Angles, Triangles, and the Pythagorean Theorem
Topics:
A. Use the properties of angles (81 – 91 odd)
B. Use the properties of triangles (93 – 107 odd)
C. Use the Pythagorean Theorem (109 – 123 odd)
Suggested Homework Exercises: 81 – 123 odd

9.4   Use Properties of Rectangles, Triangles, and Trapezoids (Part 1)
Topics:
A. Understand linear, square, and cubic measure (129 – 139 odd)
B. Use properties of rectangles (141 – 167 odd)
Suggested Homework Exercises: 129 – 167 odd

9.4   Use Properties of Rectangles, Triangles, and Trapezoids (Part 2)
Topics:
C. Use properties of triangles (169 – 195 odd)
D. Use properties of trapezoids (197 – 207 odd)
Suggested Homework Exercises: 169 – 207 odd

9.5   Solve Geometry Applications: Circles and Irregular Figures
Topics:
A. Use the properties of circles (217 – 233 odd)
B. Find the area of irregular figures (235 – 253 odd)
Suggested Homework Exercises: 217 – 253 odd

9.6   Solve Geometry Applications: Volume and Surface Area
Topics:
A. Find the volume and surface area of rectangular solids (263 – 277 odd)
B. Find the volume and surface area of spheres (279 – 285 odd)
C. Find the volume and surface area of cylinders (287 – 293 odd)
D. Find the volume of cones (295 – 301 odd)
Suggested Homework Exercises: 263 – 301 odd

9.7   Solve a Formula for a Specific Variable
Topics:
A. Use the distance, rate, and time formula (307 – 317 odd)
B. Solve a formula for a specific variable (319 – 355 odd)
Suggested Homework Exercises: 307 – 355 odd

CHAPTER 10 – POLYNOMIALS

10.1   Add and Subtract Polynomials
Topics:
A. Identify polynomials, monomials, binomials, and trinomials (1 – 7 odd)
B. Determine the degree of polynomials (9 – 13 odd)
C. Add and subtract monomials (15 – 25 odd)
D. Add and subtract polynomials (27 – 43 odd)
E. Evaluate a polynomial for a given value (45 – 49 odd)
Suggested Homework Exercises: 1 – 49 odd

10.2   Use Multiplication Properties of Exponents
Topics:
A. Simplify expressions using the Product Property of Exponents (55 – 81 odd)
B. Simplify expressions using the Power Property of Exponents (83 – 93 odd)
C. Simplify expressions using the Product to a Power Property (95 – 101 odd)
D. Simplify expressions by applying several properties (103 – 125 odd)
E. Multiply monomials (127 – 137 odd)
Suggested Homework Exercises: 55 – 137 odd

10.3   Multiply Polynomials
Topics:
A. Multiply a polynomial by a monomial (145 – 177 odd)
B. Multiply a binomial by a binomial (179 – 205 odd)
C. Multiply a trinomial by a binomial (207 – 213 odd)
Suggested Homework Exercises: 145 – 213 odd

10.4   **Divide Monomials**
Topics:
A. Simplify expressions using the Quotient Property of Exponents (219 – 229 odd)
B. Simplify expressions with zero exponents (231 – 243 odd)
C. Simplify expressions using the Quotient to a Power Property (245 – 251 odd)
D. Simplify expressions by applying several properties (253 – 275 odd)
E. Divide monomials (277 – 295 odd)
Suggested Homework Exercises: 219 – 295 odd

10.5   **Integer Exponents and Scientific Notation**
Topics:
A. Use the definition of a negative exponent (317 – 343 odd)
B. Simplify expressions with integer exponents (345 – 383 odd)
C. Convert from decimal notation to scientific notation (385 – 395 odd)
D. Convert scientific notation to decimal form (397 – 407 odd)
E. Multiply and divide using scientific notation (409 – 415 odd)
Suggested Homework Exercises: 317 – 415 odd

10.6   **Introduction to Factoring Polynomials**
Topics:
A. Find the greatest common factor of two or more expressions (423 – 441 odd)
B. Factor the greatest common factor from a polynomial (443 – 489 odd)
Suggested Homework Exercises: 423 – 489 odd

CHAPTER 11 – GRAPHS

11.1   **Use the Rectangular Coordinate System**
Topics:
A. Plot points on a rectangular coordinate system (1 – 13 odd)
B. Identify points on a graph (15 – 19 odd)
C. Verify solutions to an equation in two variables (21 – 27 odd)
D. Complete a table of solutions to a linear equation (29 – 33 odd)
E. Find solutions to linear equations in two variables (29 – 33 odd)
Suggested Homework Exercises: 1 – 33 odd

11.2   **Graphing Linear Equations**
Topics:
A. Recognize the relation between the solutions of an equation and its graph (39, 41)
B. Graph a linear equation by plotting points (43 – 81 odd)
C. Graph vertical and horizontal lines (83 – 95 odd)
Suggested Homework Exercises: 39 – 95 odd

11.3 Graphing with Intercepts
Topics:
A. Identify the intercepts on a graph (117 – 125 odd)
B. Find the intercepts from an equation of a line (127 – 153 odd)
C. Graph a line using intercepts (155 – 179 odd)
D. Choose the most convenient method to graph a line (181 – 195 odd)
Suggested Homework Exercises: 117 – 195 odd

11.4 Understand Slope of a Line
Topics:
A. Find the slope of a line from its graph (215 – 229 odd)
B. Find the slope of horizontal and vertical lines (231 – 237 odd)
C. Use the slope formula to find the slope of a line between two points (239 – 249 odd)
D. Graph a line given a point and the slope (251 – 265 odd)
E. Solve slope applications (267, 269)
Suggested Homework Exercises: 215 – 269 odd