

## Math Literacy | Table of Contents

### Chapter 1: Foundations

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- Properties of the Real Number System
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    - Illustrate two sets using Venn diagram and set notation
-

- Venn Diagram and Set Operations
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- Solve Equations Using the Division and Multiplication Properties of Equality
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  - Solve an equation that requires simplification using the division and multiplication properties of equality
- Application Problems and the Division and Multiplication Properties of Equality
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  - Use the division and multiplication properties of equality to solve application problems
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- General Strategies for Solving Linear Equations
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    - Classify equations as conditional, identity, or a contradiction
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    - Solve an equation involving fractions by eliminating the fractions and other steps
  - Solve Linear Equations with Decimals
    - Solve an equation involving decimals with variables on both sides
    - Solve an equation involving decimals by clearing the decimals
-

- Distance, Rate, and Time and Literal Equations
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  - Solve a formula for a specific variable

### 3.4 Solving Linear Inequalities

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  - Express an inequality using interval notation
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- Solving Linear Inequalities
  - Solve an inequality that requires simplification
  - Classify an inequality as conditional, identity, or contradiction
  - Translate an English sentence into an inequality and solve

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  - Use the mixture model to solve word problems [DELETE]
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  - Solve uniform motion applications
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  - Solve applications with linear inequalities

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- Reading Graphs and the Rectangular Coordinate System
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    - Complete a table of solutions to a linear equation in two variables
    - Find solutions to a linear equation
  - Graph Linear Equations in Two Variables
    - Recognize the relationship between the solutions of an equation and its graph
    - Graph a linear equation by plotting points
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- Graph a linear equation in standard form by plotting points
- Graph vertical and horizontal lines (\*1)
- Intercepts on the Coordinate Plane
  - Identify the x- and y-intercepts on a graph
  - Find the x- and y-intercepts from an equation of a line
  - Graph a line using the x- and y-intercepts (\*1)

#### 4.2 Working with Slope

- Understanding Slope
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  - Use the relationship between rise and run to find the slope of a line from its graph
- Find the slope of horizontal and vertical lines
  - Use the slope formula to find the slope of a line between two points
  - Graph a line given a point and the slope (\*1)
  - Determine the slope in applications
- Slope-Intercept Form
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  - Graph a line given its equation using its slope and y-intercept
  - Graph lines using a variety of methods
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  - Use slopes to identify perpendicular lines

#### 4.3 Equation of a Line

- Find the Equation of a Line
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  - Find an equation of the line given the slope and a point
  - Find an equation of the line given two points
- Equations of Parallel and Perpendicular Lines
  - Find an equation of a line parallel to a given line
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#### 4.4 Graphs of Linear Inequalities

- Graphing Linear Inequalities
  - Verify solutions to an inequality in two variables
  - Recognize the relationship between the solutions of an inequality and its graph
  - Graph a linear inequality

#### 4.5 Functions and Function Notation

- Introduction to Functions
    - Identify domain and range from a set of ordered pairs
    - Determine whether a relation represents a function
-

- Use the vertical line test to identify functions
- Find the domain and range of a function defined by a graph
- Function Notation
  - Understand function notation
  - Evaluate a function using function notation

## **Chapter 5: Systems of Linear Equations**

### 5.1 Solving Systems of Equations

- Solve Systems of Equations by Graphing
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  - Solve a system of linear equations by graphing
  - Determine the number of solutions of a linear system
  - Solve applications of systems of linear equations by graphing
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  - Solve a system of linear equations by substitution
  - Solve applications of systems of linear equations by substitution
- Solving Systems of Linear Equations by Elimination
  - Solve a system of linear equations by elimination
  - Solve applications of systems of equations by elimination
  - Solve a system of linear equations using a variety of methods

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- Systems of Linear Equations and Problem Solving
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  - Solve a word problem using a system of equations
  - Solve an application in geometry using a system of equations
  - Solve uniform motion applications using a system of equations
- Mixture Problems and Systems of Equations
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  - Solve mixture applications involving concentrations using a system of equations
  - Solve interest applications using a system of equations
- Solving Systems of Linear Inequalities
  - Determine whether an ordered pair is a solution of a system of linear inequalities
  - Solve a system of linear inequalities by graphing
  - Solve applications of systems of linear inequalities

## **Chapter 6: Polynomials**

### 6.1 Operations with Polynomials

- Adding and Subtracting Polynomials
    - Identify the types and degrees of polynomials
    - Add and subtract monomials
-



- Add and subtract polynomials
- Evaluate a polynomial for a given value
- Product Properties of Exponents
  - Simplify numerical expressions containing exponents
  - Simplify expressions using the product property for exponents
  - Simplify expressions using the power property for exponents or the product to a power property for exponents
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- Multiplying Polynomials
  - Multiply monomials
  - Multiply a polynomial by a monomial
  - Multiply a binomial by a binomial
  - Multiply a trinomial by a binomial
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  - Recognize and use the appropriate special product pattern

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  - Use the definition of a negative exponent
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- Scientific Notation
  - Convert from decimal notation to scientific notation
  - Convert from scientific notation to decimal notation
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## 6.4 Simplifying Square Roots

- Evaluating, Estimating, and Approximating Square Roots
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    - Estimate square roots
    - Approximate square roots
-

- Simplifying Square Roots with Variables and Square Roots in Applications
  - Simplify variable expressions with square roots
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## **Chapter 7: Factoring**

### 7.1 Factoring Quadratic Trinomials

- The Greatest Common Factor and Factoring by Grouping
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  - Factor the greatest common factor from a polynomial
  - Factor a polynomial by grouping
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  - Factor a trinomial of the form  $x^2+bx+c$  where  $c$  is positive
- Factoring Trinomials with a Leading Coefficient of 2
  - Factor a trinomial of the form  $x^2+bx+c$  where  $c$  is negative
- Factoring Trinomials with a Leading Coefficient of 3
  - Factor a trinomial of the form  $x^2+bxy+cy^2$
- Factoring Trinomials with a Leading Coefficient Other than 1
  - Factor a trinomial of the form  $ax^2+bx+c$  with a GCF
- Factoring Trinomials with a Leading Coefficient Other than 2
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- Factoring Trinomials with a Leading Coefficient Other than 3
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### 7.2 General Strategy for Factoring Polynomials

- Choosing a Factoring Strategy
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- Solving Quadratic Equations by Factoring
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  - Solve a quadratic equation by factoring
  - Solve applications modeled by quadratic equations

## **Chapter 8: Percents Ratios and Proportions**

### 8.1 Rate and Ratios

- Writing Ratios and Using Ratios in Applications
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-

- Unit Rates and Unit Prices
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  - Find unit rates
  - Find unit price
  - Translate phrases to expressions as rates or ratios

## 8.2 Proportions and Applications

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  - Convert percents to fractions
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  - Convert decimals and fractions to percents
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  - Translate and solve basic percent equations
  - Solve applications of percent
  - Find percent increase and percent decrease
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- Writing and Solving Percent Proportions
  - Write percent equations as proportions
  - Translate and solve percent proportions

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- Simple Interest and Discounts
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  - Solve discount applications
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  - Find percent increase or percent decrease
- Simple Interest Applications
  - Use the simple interest formula
  - Solve simple interest applications
- Percent, Sales Tax, and Income Tax
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  - Calculate income tax

- Simple Interest and Discount Loans
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  - Calculate interest discounts on a discounted loan

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  - Calculate compound interest
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  - Calculate the value of an annuity

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- Interpreting Graphs
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    - Determine whether the mean, median, or mode is the best measure of center for a data set
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    - Determine if a data set is skewed
-

- Standard Deviation
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  - Interpret the standard deviation of a set of data
  - Calculate the mean of a set of numbers
  - Find the median of a set of numbers
  - Find the mode of a set of numbers

### 9.3 Intro to Probability

- Averages and Probability
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  - Find the median of a set of numbers
  - Find the mode of a set of numbers
- Predictions and Probability
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## **Chapter 10: Measurement Systems, Dimensional Analysis, and Geometry**

### 10.1 Unit Conversions

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  - Identify right, acute, obtuse, and straight angles
  - Understand supplementary and complementary angles
  - Understand alternate interior angles, alternate exterior angles, and corresponding angles

### 10.2 Geometry Basics

- Points, Lines, and Planes
    - Construct a line, line segment, and ray given two points
    - Find the intersection or union of two line segments, a ray and a line segment, or two rays
    - Identify planes
-

- Polygons
  - Identify polygons given their properties
  - Use properties of similar polygons to solve for a missing side
  - Determine the measure of an angle using properties of polygons
- Triangles
  - Identify triangles given their properties
  - Use properties of triangles and right angles
  - Use properties of similar triangles to solve for a missing side
  - Use the Pythagorean theorem
- Circles
  - Find the circumference and area of circles
  - Find the area of complex shapes including circles

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  - Use properties of trapezoids
- Area and Circumference of Circles and Area of Irregular Figures
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  - Find the area of irregular figures made from rectangles and triangles
  - Find the area of irregular figures made from circles and other shapes

#### 10.4 Solve Geometry Applications - Triangles, Rectangles, and the Pythagorean Theorem

- Triangles and the Pythagorean Theorem
  - Solve problems involving the perimeter, area, and interior angles of triangles
  - Solve triangle problems where angles or sides are given in terms of other angles or sides
  - Solve triangle problems using the Pythagorean Theorem
- Area and Perimeter of Rectangles
  - Solve problems involving the perimeter and area of rectangles
  - Solve rectangle problems when the width is given in terms of the length

#### 10.5 Volume applications

- Volume and Surface Area of Rectangular Solids and Spheres
  - Find volume and surface area of rectangular solids and cubes
  - Find volume and surface area of spheres
- Volume and Surface Area of Cylinders and Cones
  - Find volume and surface area of cylinders
  - Find volume of cones

#### 10.6 Distance, rate and time formula

- The Distance, Rate, and Time Formula and Solving for a Specific Variable
    - Use the distance, rate, and time formula
    - Solve a given formula for a specific variable
    - Solve a formula for  $y$
-

## Chapter 11: Trigonometry

### 11.1 Right Triangle Trigonometry

- The Six Trigonometric Ratios
  - Use right triangles to evaluate sine, cosine, and tangent functions
  - Evaluate reciprocal trigonometric functions using right triangles for a sine, cosine, or tangent function
  - Evaluate trigonometric functions of angles not in standard position
- Use Right Triangle Trigonometry in Solving Problems
  - Find missing side lengths using trig ratios
  - Use right triangle trigonometry to solve applied problems

### 11.2 Angles as Rotations and Arc Length

- Angles as Rotations and Radian Measures
  - Identify the measure of positive and negative angles in standard position and the quadrant of the terminal side
  - Convert between degree and radian measure of an angle
  - Understand when two angles are coterminal
- Arc Length and Area of a Sector
  - Find the length of an arc
  - Find the area of a sector of a circle
  - Understand the relationship between linear and angular speed

### 11.3 The Unit Circle

- Sine and Cosine Values in the First Quadrant
    - Understand sine and cosine values on the unit circle
    - Find exact sine and cosine values for angles in the first quadrant of the unit circle
  - Sine and Cosine Values with Reference Angles
    - Find the reference angle for a given angle
    - Use reference angles to evaluate sine and cosine functions
    - Use reference angles to find coordinates on the unit circle
    - Evaluate sine and cosine functions with a calculator
  - The Other Trigonometric Ratios on the Unit Circle
    - Find the secant, cosecant, tangent, and cotangent values for angles in the first quadrant of the unit circle
    - Use reference angles to evaluate secant, cosecant, tangent, and cotangent functions
    - Evaluate trigonometric functions with a calculator
  - Use Given Trigonometric Ratios to Find Other Ratios
    - Understand the relationship between the quadrant in which an angle falls and the signs of the trig functions of that angle
    - Use the pythagorean identity
    - Find the values of all trigonometric functions given coordinates on a unit circle
    - Find the values of all trigonometric functions given the value of one trigonometric function
-