

PR_Math Grade 10 - Algebra2 (ENG)

1. Fundamentals of Algebra

1.1 Properties of Real Numbers.

- 1.1.1 Properties of Real Numbers
- 1.1.2 Distributive Property

1.2 The Cartesian Plane

- 1.2.1 The Distance between two points
- 1.2.2 The Midpoint of a line segment

1.3 Graphing Linear Equations in Two Variables

- 1.3.1 Graphing a linear equation using points
- 1.3.2 Graphing a linear equation Using intercepts

1.4 Introduction to Functions

- 1.4.1 Write a Dependency Statement
- 1.4.2 Identify Some Elementary Functions
- 1.4.3 Evaluate a Function
- 1.4.4 Graph of a Function

2. Linear Equations in Two Variables

2.1 Slope of a Line

- 2.1.1 Slope of a Line Through Two Given Points
- 2.1.2 Finding the slope of a line from the equation of the line
- 2.1.3 Slope of Parallel and Perpendicular Lines

2.2 Equation of a Line

- 2.2.1 Slope-Intercept Form of a Line
- 2.2.2 Graphing a Line in the Slope-Intercept Form
- 2.2.3 Equation of a line given slope and any point on the line
- 2.2.4 Writing Equations in slope intercept or Standard Form
- 2.2.5 Equation of a line in Two-point Form

2.3 Variation

- 2.3.1 Direct Variation
- 2.3.2 Inverse Variation
- 2.3.3 Joint Variation

2.4 Solving by Graphs

- 2.4.1 Identifying a Solution of a system of Linear...
- 2.4.2 Solving by Graphing
- 2.4.3 Intersecting, Parallel, and Coincident Lines

2.5 Solving using Substitution

- 2.5.1 Solving by Substitution
- 2.5.2 Intersecting

2.6 Solving using Elimination by Addition

- 2.6.1 Solve linear systems by Addition Method
- 2.6.2 Identify the Graphs of Systems

2.7 Solving Systems of Linear Inequalities

- 2.7.1 Solving a system of linear Inequalities

2.8 Gauss-Jordan Method of Solving a System of Linear Equations

- 2.8.1 Write Coefficient Matrix and Augmented Matrix
- 2.8.2 Perform Three Basic Row Operations
- 2.8.3 Use Gauss-Jordan Method to Solve Systems of Linear Equations

2.9 Determinants and its use for Solution of the System

- 2.9.1 Determine the Value of a 2×2 Determinant
- 2.9.2 Determine the Value of a 3×3 Determinant
- 2.9.3 Use Row Operations on Determinants
- 2.9.4 Apply Cramer's Rule for Solving Systems of Equations using Determinants

3. Quadratic Functions

3.1 Complex Numbers

- 3.1.1 Define and Identify Complex Numbers
- 3.1.2 Add and Subtract Complex Numbers
- 3.1.3 Multiply Complex Numbers
- 3.1.4 Find Quotients of Complex Numbers

3.2 Solving By Graphing

- 3.2.1 Graphing a Quadratic Equation
- 3.2.2 Finding the Vertex of a Parabola
- 3.2.3 Approximating Real Solutions of a Quadratic Equation Graphically
- 3.2.4 Maximum or Minimum Value of a Quadratic Function

3.3 Solving Quadratic Equations by Factoring

- 3.3.1 Zero Factor Property
- 3.3.2 Solving Quadratic Equations
- 3.3.3 Zero Factor Property for more than two Factors

3.4 Square Root Property

- 3.4.1 Solve Equations of the form $x^2=k$ and $(ax + b)^2=k$, k positiv...**

3.5 Completing the Square

- 3.5.1 Identify a term for making $x^2 + bx$ a Perfect Square
- 3.5.2 Solve $x^2 + bx + c = 0$ by Completing Square
- 3.5.3 Solve $ax^2 + bx + c = 0$ by Completing Square

3.6 The Quadratic formula

3.6.1 The Quadratic formula

3.6.2 Using the Quadratic formula for Solving Quadratic Equations

3.6.3 Applications

3.7 Solutions of Quadratic Inequalities

3.7.1 Solutions of Quadratic Inequalities

4. Polynomial and Rational Functions

4.1 Polynomials

4.1.1 Polynomials, Terms, Coefficient

4.1.2 Evaluating a Polynomial

4.1.3 Adding Polynomials

4.1.4 Subtracting Polynomials

4.2 Multiplication of Polynomials

4.2.1 Product of monomial & polynomial

4.2.2 Product of Two Polynomials

4.2.3 FOIL Method

4.3 The Quotient of Two Polynomials

4.3.1 Dividing a Polynomial by a Monomial

4.3.2 Quotient of Two Polynomials

4.3.3 Use Synthetic Division

4.3.4 The Remainder Theorem

4.4 Graphs of Polynomial Functions

4.4.1 Graphing a Polynomial Function

4.4.2 The Behavior of a Polynomial Function at Infinity

4.5 Evaluating Rational Expressions

4.5.1 Identify, where a Rational Expression is not ...

4.5.2 Evaluate Rational Expressions

4.6 Multiplying and Dividing Rational Expressions

4.6.1 Multiply Rational Expressions

4.6.2 Divide Rational Expressions

4.7 Least Common Denominator of Rational Expression

4.7.1 Least Common Denominator (LCD) of Rational Expressions

4.7.2 Rewrite a Rational Expression with a given New Denominator

4.8 Equations with Rational Expressions

4.8.1 Solve Equations containing Rational Expressions

4.9 Finding Roots

4.9.1 Find Roots

4.9.2 Decimal Approximations for Irrational Square Roots and Cube Roots

4.9.3 Pythagorean Theorem

4.10 Multiplication and Division of Radicals

4.10.1 Multiply Radicals

4.10.2 Simplify Radicals with the Product Rule

4.10.3 Simplify Quotients of Radicals with the Quotient Rule

4.11 Rationalizing the Denominators

4.11.1 Rationalize Denominators with one Term

4.11.2 Write Radicals in Simplified Form

4.11.3 Rationalize Denominators involving Two Terms

4.12 Fractional Exponents and Radical Equations

4.12.1 Simplify Expressions with exponents of the type $(1/n)$

4.12.2 Solve Equations with Radicals : Simple

4.13 Graphs of Rational Functions

4.13.1 The Behavior of $f(x) = (p(x)/q(x))$ near $x = a$ where $p(a) \neq 0$, but $q(a) = 0$

4.13.2 Vertical Asymptotes

4.13.3 Horizontal Asymptotes

4.13.4 Graphing a Rational Function

5. Exponential and Logarithmic Functions

5.1 Inverse Functions

5.1.1 One-to-One Functions

5.1.2 Inverse Functions

5.2 Exponential Functions and their Graphs

5.2.1 Explore Exponential Functions and their Graphs

5.3 Performing Conversions between Exponential and Logarithmic Functions

5.3.1 Write Logarithmic Statements as Exponential Statements

5.3.2 Write Exponential Statements as Logarithmic Statements

5.3.3 Graph Logarithmic Functions

5.4 The properties of logarithmic functions

5.4.1 Expand a Single-Logarithm Expression

5.4.2 Rewrite a Multi-Logarithm Expression

5.5 Solving Exponential Equations

5.5.1 Solve Exponential Equations of the "Same Base" type

5.5.2 Solve Exponential Equations of the "Different Bases" type

5.6 Solving Logarithmic Equations

- 5.6.1 Solve “Single-Logarithm” Equations
- 5.6.2 Solve “Multi-Logarithm” Equations
- 5.6.3 Evaluate Logarithmic Expressions

5.7 Applications

- 5.7.1 Solve Applications involving continuous Interest and Population Growth

6. Right Triangle

6.1 The Pythagorean Theorem

- 6.1.1 Applications involving the use of Pythagorean Theorem

6.2 Circular Functions of Angles

- 6.2.1 Circular Functions of Angles
- 6.2.2 Evaluating Circular Functions
- 6.2.3 Signs of Circular Functions of Angles

6.3 Evaluating Circular Functions

- 6.3.1 The Reference Angle
- 6.3.2 The Exact Values of Circular Functions

6.4 Trigonometric Functions of Angles

- 6.4.1 The Trigonometric Functions
- 6.4.2 Applications of Trigonometric Functions
- 6.4.3 Slope of a line and The Area of a Triangle

7. Sequences, Series, and Binomial Expansion

7.1 Sequences

- 7.1.1 Identify Finite and Infinite Sequences
- 7.1.2 Identify if the Terms of a Sequence have a Definite Pattern
- 7.1.3 Write a Sequence as a Function

7.2 Arithmetic Sequences

- 7.2.1 Define an Arithmetic Sequence
- 7.2.2 Find the General term of an Arithmetic Sequence
- 7.2.3 Find Arithmetic means
- 7.2.4 Graph of an Arithmetic Sequence

7.3 Geometric Sequences

- 7.3.1 Define a Geometric Sequence
- 7.3.2 Find the general term of a Geometric Sequence
- 7.3.3 Find Geometric Mean(s)
- 7.3.4 Graph a Geometric Sequence

7.4 Arithmetic Series

- 7.4.1 Use Sigma Notation for Summation
- 7.4.2 Find the Sum of the First n Terms of an Arithmetic Sequence

7.5 Geometric Series

7.5.1 Find the Sum of First n Terms of a Geometric Series

7.5.2 Find the Sum of an Infinite Geometric Series

7.6 Pascal's Triangle and Binomial Expansion

7.6.1 Expand a Binomial Raised to Certain Power using Pascal's Triangle

7.6.2 Calculate $n!$ (n Factorial)

7.6.3 Apply a Binomial Theorem

7.6.4 Find a general term of a Binomial Expansion

8. Functions

8.1 Functions

8.1.1 The definition of a Function

8.1.2 Elementary Functions

8.2 Domain of a Function

8.2.1 The Domain of a Function

8.3 Connections between different forms of function representation

8.3.1 Connections between different forms of function representation

8.4 Operations on Functions

8.4.1 The Basic Operations

8.4.2 Composite Functions