Math Content in Laurus

Laurus contains 3 areas of content:
(1) Basics Review,
(2) High School—Algebra and Geometry
(3) College/Work Readiness.

The High School and College/Work Readiness standards correspond completely with the Arizona High School new 2008 High School Math Standards.

Each of the bulleted topics below contain the following 4 features that covers that topic:
- Video Tutorials
- Printable Notes
- Review Problems
- Quizzes

Below are the details of the topics covered in each area of content.

**Basics Review**

1. NUMBERS
   a. Integers
      - Adding and Subtracting Integers
      - Multiplying and Dividing Integers
      - Exponents
      - The Coordinate Plane
   b. Rational Numbers
      - Greatest Common Factor and Least Common Multiple
      - Adding and Subtracting Fractions
      - Multiplying and Dividing Fractions
      - Adding and Subtracting Decimals
      - Multiplying and Dividing Decimals
      - Fractions, Decimals, and Percents
      - The Percent Equation
   c. Irrational Numbers
      - Radicals
      - Adding and Subtracting Radicals
      - Multiplying and Dividing Radicals
      - Ordering Numbers

2. EXPRESSIONS AND EQUATIONS
   a. Algebraic Expressions
      - Evaluating Expressions
      - Translating Words into Algebraic Expressions
      - Simplifying Expressions
      - Distributive Property
   b. Solving Equations
      - Solving One-Step Equations
      - Solving Multi-Step Equations
      - Solving Equations Involving Fractions

3. BASIC GEOMETRY
   a. Shapes
      - Undefined Terms
      - Angles
      - Polygons
   b. Measurement
      - Length
      - Perimeter
      - Area
      - Formulas
High School: Algebra and Geometry Standards
*MATH AIMS TEST MATERIAL*

Strand 1: NUMBER AND OPERATIONS
Concept 1: Number Sense
- PO 1: Real Number System
- PO 2: Finite or Infinite Sets of Numbers
- PO 3: Absolute Value
Concept 2: Numerical Operations
- PO 1: Solving Word Problems
- PO 2: Properties of Real Number Operations
- PO 3: Calculating Powers and Roots of Numbers
- PO 4: Scientific Notation
Concept 3: Estimation
- PO 1: Rational Approximations of Irrational Numbers
- PO 2: Using Estimation to Determine the Reasonableness of a Solution
- PO 3: When Estimation is More Appropriate than an Exact Answer
- PO 4: Estimating the Location of Numbers on a Number Line

Strand 2: DATA ANALYSIS, PROBABILITY, and DISCRETE MATHEMATICS
Concept 1: Data Analysis (Statistics)
- PO 1: Drawing Inferences About Data Sets
- PO 2: Organizing Data Into Appropriate Graphical Representation
- PO 3: Displaying Data and Making Predictions From Patterns
- PO 4: Making Inferences Using One or More Summary Statistics
- PO 5: Measures of Central Tendency
- PO 6: Reasonable Conclusions Drawn from Data Analysis
- PO 7: Misrepresentations of Data
- PO 8: Designing Experiments and Collecting Data
Concept 2: Probability
- PO 1: Making Predictions Based on Theoretical Probability Models
- PO 2: Theoretical vs Experimental Probability
- PO 3: Using Simulations Involving Independent and Dependent Events
- PO 4: Law of Large Numbers
- PO 5: Geometric Probability
Concept 3: Systematic Listing and Counting
- PO 1: Addition and Multiplication Principles of Counting
- PO 2: Permutations vs Combinations
- PO 3: Determining the Number of Possible Outcomes of an Event
Concept 4: Vertex-Edge Graphs
- PO 1: Solving Network Problems Using Graphs and Matrices

Strand 3: PATTERNS, ALGEBRA, and FUNCTIONS
Concept 1: Patterns
- PO 1: Sequences
- PO 2: Terms of a Sequence
- PO 3: Creating Sequences Using Explicit and Recursive Formulas
Concept 2: Functions and Relationships
- PO 1: Sketching and Interpreting Graphs
- PO 2: Is the Relation a Function?
- PO 3: Using Function Notation and Evaluating Functions
- PO 4: Expressing a Relationship Between Two Variables
- PO 5: Modeling Problems with Systems of Equations
- PO 6: Quadratic Functions
- PO 7: Domain and Range of a Function
Concept 3: Algebraic Relationships
- PO 1: Equivalent Forms Equations or Expressions
- PO 2: Solving Formulas for Specified Variables
- PO 3: Writing the Equation of a Line
- PO 4: Parallel, Perpendicular, Coinciding, or Intersecting Lines
- PO 5: Solving Linear Equations and Absolute Value Equations with One Variable
- PO 6: Solving Linear Inequalities in One Variable
- PO 7: Solving Systems of Two Linear Equations in Two Variables
- PO 8: Simplifying and Evaluating Polynomials and Rational Expressions
- PO 9: Multiplying and Dividing Monomial Expressions
- PO 10: Operations with Polynomial and Rational Expressions
- PO 11: Solving Square Root Equations
- PO 12: Factoring Quadratic Polynomials
- PO 13: Solving Quadratic Equations
- PO 14: Factoring Higher Order Polynomials
- PO 15: Operations with Matrices
Concept 4: Analysis of Change
- PO 1: Determining the Slope and Intercepts of the Graph of a Linear Function
- PO 2: Solving Problems Involving Rates of Change
- PO 3: Solving Interest Problems
Strand 4: GEOMETRY and MEASUREMENT

Concept 1: Geometric Properties
- PO 1: Basic Properties of Circles
- PO 2: 3-Dimensional Objects and Their 2-Dimensional Representations
- PO 3: Inductive and Deductive Arguments
- PO 4: Parallel Lines, Perpendicular Lines, and Angles
- PO 5: Euclid's Five Postulates
- PO 6: Angle and Side Length Relationships
- PO 7: Hierarchy of Quadrilaterals
- PO 8: Proving Similarity and Congruence of Triangles
- PO 9: Triangle Inequality Property
- PO 10: Solving Problems Using Right Triangles
- PO 11: Using the Sine, Cosine, and Tangent Ratios

Concept 2: Transformation of Shapes
- PO 1: Transformations of 2-Dimensional Figures that Preserve Congruency
- PO 2: Single Transformations of 2-Dimensional Figures
- PO 3: Two or More Transformations of 2-Dimensional Figures
- PO 4: Effects of Single Transformations On Linear or Area Measurements of 2-Dimensional Figures

Concept 3: Coordinate Geometry
- PO 1: Finding the Midpoint Between Two Points
- PO 2: The Pythagorean Theorem
- PO 3: Distance Between Two Points
- PO 4: Confirming Parallelism, Perpendicularity, and Congruence in Geometric Figures
- PO 5: Graphing Linear Equations and Inequalities in Two Variables
- PO 6: Effects of Changing the Parameters of a Linear Function
- PO 7: Solving Systems of Equations in Two Variables Graphically
- PO 8: Graphing Quadratic Functions and Interpreting the Intercepts and Zeros

Concept 4: Measurement
- PO 1: Using Dimensional Analysis
- PO 2: Lengths of Circular Arcs and Areas of Sectors of a Circle
- PO 3: Effects of Changing Dimensions On Perimeter, Area, and Volume of a Figure
- PO 4: Ratios and Proportions
- PO 5: Surface Area and Volume

Strand 5: STRUCTURE and LOGIC

Concept 1: Algorithms and Algorithmic Thinking
- PO 1: Mathematical Algorithms
- PO 2: Validity and Equivalence of Algorithms

Concept 2: Logic, Reasoning, Problem Solving, and Proof
- PO 1: Problem Solving
- PO 2: Using One or More Problem Solving Strategies
- PO 3: Reasonableness and Meaning of Solutions in Context
- PO 4: Generalizations In Inductive and Deductive Reasoning
- PO 5: Using Formal and Informal Reasoning
- PO 6: Synthesizing Mathematical Information
- PO 7: Structural Similarities Within Algebraic Expressions and Geometric Figures
- PO 8: Inductive and Deductive Reasoning and Counterexamples
- PO 9: Stating the Inverse, Converse, and Contrapositive of a Given Statement
- PO 10: Listing If...Then Statements in Order
- PO 11: Drawing Conclusions from If...Then Statements
- PO 12: Constructing a Simple Formal Deductive Proof
- PO 13: The Logical Structure of Mathematics
**College/Work Readiness**

Strand 1: NUMBER AND OPERATIONS

Concept 1: Number Sense
- PO 1: Complex Number Solutions
- PO 2: Numerical Expressions in Radical and Exponential Form

Concept 2: Numerical Operations
- PO 1: Properties of Complex Numbers and Matrices
- PO 2: Computations with Complex Numbers
- PO 3: Graphing Complex Numbers
- PO 4: Polar Coordinates
- PO 5: Trigonometric Form of Complex Numbers
- PO 6: Calculate Products, Powers, and Roots of Complex Numbers

Concept 3: Estimation
- PO 1: Limitations of Estimation and Error

Strand 2: DATA ANALYSIS, PROBABILITY, and DISCRETE MATHEMATICS

Concept 1: Data Analysis (Statistics)
- PO 1: Estimating and Computing with One-Variable and Two-Variable Data
- PO 2: Comparing Data Sets
- PO 3: Summary Statistics for Distributions of Data
- PO 4: Impacts of Sampling Methods, Bias, and Wording of Questions
- PO 5: Misleading Uses of Data
- PO 6: Randomized Experiments and Observational Studies
- PO 7: Correlation and Causation
- PO 8: Line of Best Fit
- PO 9: Using Matrices to Organize and Represent Data

Concept 2: Probability
- PO 1: Probability Concepts
- PO 2: Normal Distribution
- PO 3: Predicting Outcomes Using One-Variable and Two-Variable Data
- PO 4: Dependent vs Independent Events

Concept 3: Systematic Listing and Counting
- PO 1: Using the Binomial Theorem
- PO 2: Connections Between Binomial Coefficients, Pascal's Triangle, and Combinations

Concept 4: Vertex-Edge Graphs
- PO 1: Types of Vertex-Edge Graphs
- PO 2: Understanding, Analyzing, and Applying Vertex-Edge Graphs
- PO 3: Solving Vertex-Edge Graph Problems
- PO 4: Using Adjacency Matrices for Graphs

Strand 3: PATTERNS, ALGEBRA, and FUNCTIONS

Concept 1: Patterns
- PO 1: Sequences and Series
- PO 2: Applying Recursive Formulas
- PO 3: Explicit and Recursive Formulas
- PO 4: Recursion
- PO 5: Using Sigma Notation

Concept 2: Functions and Relationships
- PO 1: Solving Problems Modeled by Functions
- PO 2: Using Function Notation
- PO 3: Graphing Absolute Value, Step, and Piecewise-Defined Functions
- PO 4: Graphing Exponential Functions
- PO 5: Graphing Power Functions
- PO 6: Graphing Polynomial Functions
- PO 7: Analyzing Functions
- PO 8: Conic Sections
- PO 9: Trigonometric Functions
- PO 10: Finding the Inverse of a Function
- PO 11: Approximating Solutions for Polynomial Equations
- PO 12: Using Theorems of Polynomial Behavior to Find the Zeros of a Polynomial Function
- PO 13: Properties of Logarithms
- PO 14: Performing Operations on Functions
- PO 15: Even and Odd Functions
- PO 16: Degrees of a Polynomial
- PO 17: Informal Notion of Limits

Concept 3: Algebraic Representations
- PO 1: Equivalent Algebraic Expressions
- PO 2: Laws of Exponents
- PO 3: Solving Systems of Three Linear Equations in Three Variables
- PO 4: Using Matrices to Represent Systems of Linear Equations
- PO 5: Simplifying Radical Expressions
- PO 6: Dividing Polynomials
- PO 7: Finding Complex Solutions of Quadratic Equations
- PO 8: Solutions, Zeros, X-Intercepts, and Factors
- PO 9: Using Matrix Operations
- PO 10: Representing Vectors as Matrices
- PO 11: Operations with Vectors

Concept 4: Analysis of Change
- PO 1: Independent and Dependent Variables
- PO 2: The Rate of Change of a Function
- PO 3: Modeling and Solving Word Problems
- PO 4: Comparing Relative Magnitudes of Functions
- PO 5: Solving Problems Involving Compound Interest
- PO 6: Relationship between Simple and Compound Interest
- PO 7: Determining Total Costs of Purchases
- PO 8: Calculating Income Tax
- PO 9: Developing a Budget
- PO 10: Creating a Retirement Savings Plan
- PO 11: Compare and Contrast Different Insurances
Test-Taking Strategies Section

Also included is a dedicated section with videos and notes on strategies students can use before taking tests.

1. Before the Test
   • Mental and Physical Strategies

2. Test Day
   • Mental and Physical Strategies

3. After the Test
   • Mental and Physical Strategies