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This is a resubmission for the course a-g Integrated Math I

Teacher Contact

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* Course Title: a-g Integrated Math I

* Transcript Title /Abbreviation: Transcript Title /Abbreviation: Course Code a-g Integrated Math I

* Seeking "Honors" Distinction: No

* Subject Area: Mathematics

* Category: Integrated Math 1

* Grade Level for which this course has been designed: [x] 9 [x] 10 [] 11 [] 12

* Unit Value: 1.0 (one year, 2 semesters, or 3 trimesters equiv.)

* ...

*** **IS THIS COURSE CLASSIFIED AS A CAREER TECHNICAL EDUCATION:** No

* **Brief Course Description**

The course content includes: functions; algebra; geometry; statistics; probability; discrete mathematics; measurement; number; logic; and language. The course emphasizes mathematical reasoning, problem solving, and communication through integration of the various strands, connections with other subject areas and real-life applications. The course emphasis is algebra.

Pre-Requisites

Pre-Algebra - Required

Co-Requisites

Context for Course (optional)

History of Course Development (optional)

Textbooks

TEXTBOOK 1

* **Title:** Algebra I

* **Edition:** Third Edition

*
Publication Date: 1997

*
Publisher: Saxon

*
Author(s): John H. Saxon Jr.

URL Resource:

* **Usage:** Primary Text

Read in entirety or near entirety

Supplemental Instructional Materials

* Course Purpose

The key content for the Integrated Math, involves understanding, writing, solving, and graphing linear and quadratic equations, including systems of two linear equations in two unknowns. Quadratic equations may be solved by factoring, completing the square, using graphs, or applying the quadratic formula. Students should also become comfortable with operations on monomial and polynomial expressions. They learn to solve problems employing all of these techniques, and they extend their mathematical reasoning in many important ways, including justifying steps in an algebraic procedure and checking. In addition, the student will learn to solve problems involving geometric skills like finding area, lateral surface area, and volume of geometric solids, prisms, cylinders and spheres. They will learn and use the Pythagorean Theorem and the use of Pythagorean Triples. The main topical objectives are:

? Operations ? Linear Equations and Inequalities ? Polynomials ? Quadratic Equations
? Relations & Functions ? Word problems

* Course Outline

Coursework will include a thorough understanding and application of the following topics as they are presented in the text:

Students identify and use the arithmetic properties of subsets of integers and rational, irrational, and real numbers, including closure properties for the four basic arithmetic operations where applicable:

Students understand and use such operations as taking the opposite, finding the reciprocal, taking a root. They understand and use the rules of exponents.

Students simplify expressions before solving linear equations and inequalities in one variable,

Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.

Students graph a linear equation and compute the x- and y-intercepts.

Students verify that a point lies on a line, given an equation of the line.

Students are able to derive linear equations.

Students understand the concepts of parallel lines and how those slopes are related.

Students solve a system of two linear equations in two variables algebraically and are able to interpret the answer graphically.

Students are able to solve a system of two linear inequalities in two variables and to sketch the solution sets.

Students add, subtract, multiply, and divide monomials and polynomials.

Students solve multistep problems, including word problems, by using these techniques.

Students apply basic factoring techniques to second- and simple third- degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials.

Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems.

Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions.

Students determine the domain of independent variables and the range of dependent variables defined by a graph, a set of ordered pairs, or a symbolic expression.

Students determine whether a relation defined by a graph, a set of ordered pairs, or a symbolic expression is a function and justify the conclusion.

Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations.

Students graph quadratic functions and know that their roots are the x-intercepts.

Students use the quadratic formula or factoring techniques or both to determine whether the graph of a quadratic function will intersect the x-axis in zero, one, or two points.

Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity.

Students use and know simple aspects of a logical argument:

Students explain the difference between inductive and deductive reasoning and identify and provide examples of each.

Students identify the hypothesis and conclusion in logical deduction.

Students use counterexamples to show that an assertion is false and recognize

that a single counterexample is sufficient to refute an assertion.

Students use properties of the number system to judge the validity of results, to justify each step of a procedure, and to prove or disprove statements:

Students use properties of numbers to construct simple, valid arguments (direct and indirect) for, or formulate counterexamples to, claimed assertions.

Students judge the validity of an argument according to whether the properties of the real number system and the order of operations have been applied correctly at each step.

Given a specific algebraic statement involving linear, quadratic, or absolute value expressions or equations or inequalities, students determine whether the statement is true sometimes, always, or never.

Students solve problems involving finding the surface area, lateral surface area, and volume of geometric solids, spheres, prisms, and cylinders.

Students will learn and use the Pythagorean Theorem to solve problems involving figures as well as word problems.

Scope of Curriculum Includes:

Operations with Whole Numbers, Fractions, Decimals

Graphs on the Coordinate Plane

Number Sets - Classify the real numbers, Natural (counting) numbers and whole numbers, Integers, rational numbers, and irrational numbers 2, Prime and composite numbers

Perform operations with integers - Symbols of inclusion, Absolute value,

Identifying negative numbers, Opposites with multiple signs within order of operations, Parentheses, braces, and brackets, Understand elementary number theory, Divisibility rules, Prime and composite numbers, Multiples, Find least common multiples, Find reciprocals, Find greatest common factors, Understand inverse operations, Know the properties of real numbers

Conversions within and between the English and Metric Systems

Conversions within and between the English and Metric Systems

Ratio, Proportion, Percent, and Rate

Operations with and use of Exponents and Roots

Statistics and Probability

Simplifying and Solving Expressions

Graphing, Solving, Using Linear Equations

Solving Quadratic Equations

Understanding Functions

Geometry - Lines, Points, Segments, and Planes, Angles, Polygons, Circles, Triangles, Geometric Solids, Perimeter, Circumference, Area, Surface Area, Volume, Pythagorean Theorem

*** Key Assignments**

Unit by unit problem sets and Unit tests.

Written exams: Chapter quizzes, comprehensive midterm/final.

Applied concepts projects as determined by teacher.

Each lesson will be divided into 4 parts.

Part 1 - Warm up using concepts/problems from previous days lessons.

Part 2 - Review of previous days concept and instruction/demonstration of new concept for that day.

Part 3 - Practice of new concept through problems assigned from book.

Part 4 - Assignment for each lesson with a mixture of problems from previous lessons and the new instruction given that day.

Lessons listed below:

- * 1 Addition and Subtraction of Fractions ??? Lines and Segments
- * 2 Angles?? Polygons ??? Triangles ??? Quadrilaterals
- * 3 Perimeter?? Circumference
- * 4 Review of Arithmetic
- * 5 Sets?? Absolute Value ??? Addition of Signed Numbers
- * 6 Rules for Addition ??? Adding More Than Two Numbers ??? Inserting Parentheses Mentally ??? Definition of Subtraction
- * 7 The Opposite of a Number ??? Simplifying More Difficult Notations
- * 8 Area
- * 9 Rules for Multiplication of Signed Numbers ??? Inverse Operations ??? Rules for Division of Signed Numbers ??? Summary??
- * 10 Division by Zero ??? Exchange of Factors in Multiplication ??? Conversions of Area
- * 11 Reciprocal and Multiplicative Inverse ??? Order of Operations ??? Identifying Multiplication and Addition

- * 12 Symbols of Inclusion ??? Order of Operations

- * 13 Multiple Symbols of Inclusion?? More on Order of Operations ??? Products of Signed Numbers

- * 14 Evaluation of Algebraic Expressions

- * 15 Surface Area

- * 16 More Complicated Evaluations

- * 17 Factors and Coefficients?? Terms ??? The Distributive Property

- * 18 Like Terms ??? Addition of Like Terms

- * 19 Exponents?? Powers of Negative Numbers ??? Roots ??? Evaluation of Powers

- * 20 Volume

- * 21 Product Rule for Exponents ??? Addition of Like Terms with Exponents

- * 22 Review of Numerical and Algebraic Expressions ????? Statements and Sentences

- ??? Conditional Equations

- * 23 Equivalent Equations ??? Additive Property of Equality

- * 24 Multiplicative Property of Equality

- * 25 Solution of Equations

- * 26 More Complicated Equations

- * 27 More on the Distributive Property ????? Simplifying Decimal Equations

- * 28 Fractional Parts of Numbers ??? Functional Notation

- * 29 Negative Exponents ??? Zero Exponents

- * 30 Algebraic Phrases, ??? Decimal Parts of a Number

- * 31 Equations with Parentheses

- * 32 Word Problems

- * 33 Products of Prime Factors ??? Statements About Unequal Quantities

- * 34 Greatest Common Factor

- * 35 Factoring the Greatest Common Factor ??? Canceling

- * 36 Distributive Property of Rational Expressions that Contain Positive Exponents
??? Minus Signs and Negative Exponents.

- * 37 Inequalities???? ??? Greater Than and Less Than ??? Graphical Solutions of Inequalities

- * 38 Ratio Problems

- * 39 Trichotomy Axiom ??? Negated Inequalities ??? Advanced Ratio Problems

- * 40 Quotient Rule for Exponents' Distributive Property of Rational Expressions that Contain Negative Exponents

- * 41 Addition of Like Terms in Rational Expressions ??? Two-Step Problems

- * 42 Solving Multivariable Equations

- * 43 Least Common Multiple ??? Least Common Multiples of Algebraic Expressions

- * 44 Addition of Rational Expressions with Equal Denominators ?????Addition of Rational Expressions with Unequal Denominators

- * 45 Range, Median, Mode, and Mean

- * 46 Conjunctions

- * 47 Percents Less Than 100 ??? Percents Greater Than 100

- * 48 Polynomials?? ??? Degree?? ??? Addition of Polynomials

- * 49 Multiplication of Polynomials

- * 50 Polynomial Equations ??? Ordered Pairs ??? Cartesian Coordinate System

- * 51 Graphs of Linear Equations ??? Graphs of Vertical and Horizontal Lines

- * 52 More on Addition of Rational Expressions with Unequal Denominators ??? Overall Average

- * 53 Power Rule for Exponents ??? Conversions of Volume

- * 54 Substitution Axiom ??? Simultaneous Equations ??? Solving Simultaneous Equations by Substitution

- * 55 Complex Fractions ??? Division Rule for Complex Fractions

- * 56 Finite and Infinite Sets ??? Membership in a Set ??? Rearranging Before Graphing

- * 57 Addition of Algebraic Expressions with Negative Exponents

- * 58 Percent Word Problems

- * 59 Rearranging Before Substitution

- * 60 Geometric Solids ??? Prisms and Cylinders

- * 61 Subsets ??? Subsets of the Set of Real Numbers

- * 62 Square Roots ??? Higher Order Roots ??? Evaluating Using Plus or Minus

- * 63 Product of Square Roots Rule ??? Repeating Decimals

- * 64 Domain ??? Additive Property of Inequality

- * 65 Addition of Radical Expressions ??? Weighted Average

- * 66 Simplification of Radical Expressions ??? Square Roots of Large Numbers

- * 67 Review of Equivalent Equations ??? Elimination

- * 68 More About Complex Fractions

* 68 MORE ABOUT COMPLEX FRACTIONS

* 69 Factoring Trinomials

* 70 Probability ??? Designated Order

* 71 Trinomials with Common Factors ??? Subscripted Variables

* 72 Factors That Are Sums ??? Pyramids and Cones

* 73 Factoring the Difference of Two Squares ??? Probability Without Replacement

* 74 Scientific Notation

* 75 Writing the Equation of a Line?? Slope-Intercept Method of Graphing

* 76 Consecutive Integers

* 77 Consecutive Odd and Consecutive Even Integers ??? Fraction and Decimal Word Problems

* 78 Rational Equations

* 79 Systems of Equations with Subscripted Variables

* 80 Operations with Scientific Notation

* 81 Graphical Solutions ??? Inconsistent Equations ??? Dependent Equations

* 82 Evaluating Functions ??? Domain and Range

* 83

↑ 83 Coin Problems

* 84 Multiplication of Radicals ??? Functions

* 85 Stem-and-Leaf Plots ??? Histograms

* 86 Division of Polynomials

* 87 More on Systems of Equations ??? Tests for Functions

* 88 Quadratic Equations ??? Solution of Quadratic Equations by Factoring

* 89 Value Problems

*90 Word Problems with Two Statements of Equality

* 91 Multiplicative Property of Inequality ??? Spheres

* 92 Uniform Motion Problems About Equal Distances

* 93 Products of Rational Expressions ??? Quotients of Rational Expressions

* 94 Uniform Motion Problems of the Form $D_1 + D_2 = N$

* 95 Graphs of Non-Linear Functions ??? Recognizing Shapes of Various Non-Linear Functions

* 96 Difference of Two Squares Theorem

* 97 Angles and Triangles ??? Pythagorean Theorem ??? Pythagorean Triples

* 98 Distance Between Two Points ??? Slope Formula

- * 99 Uniform Motion-Unequal Distances

- * 100 Place Value ??? Rounding Numbers

- * 101 Factorable Denominators

- * 102 Absolute Value Inequalities

- * 103 More on Rational Equations

- * 104 Abstract Rational Equations

- * 105 Factoring by Grouping

- * 106 Linear Equations ??? Equation of a Line Through Two Points

- * 107 Line Parallel to a Given Line ??? Equation of a Line with a Given Slope

- * 108 Square Roots Revisited ??? Radical Equations

- * 109 Advanced Trinomial Factoring

- * 110 Vertical Shifts ??? Horizontal Shifts ??? Reflection About the x Axis???
Combinations of Shifts and Reflections

- * 111 More on Conjunctions ??? Disjunctions

- * 112 More on Multiplication of Radical Expressions

- * 113 Direct Variation?? Inverse Variation

* 114 Exponential Key ??? Exponential Growth ??? Using the Graphing Calculator to Graph Exponential Functions

* 115 Linear Inequalities

* 116 Quotient Rule for Square Roots

* 117 Direct and Inverse Variation Squared

* 118 Completing the Square

* 119 The Quadratic Formula ??? Use of the Quadratic Formula

* 120 Box-and-Whisker Plots

??

* **Instructional Methods and/or Strategies**

Instructional Methods and/or Strategies:

College Model of Education: Personalized Learning Model emphasizes independent study while attending Resource Center classes three times weekly.

Classroom Instruction

Direct Instruction

Project group work

Independent Study

Interactive online instruction

Lab assignments/experiments

Work individually with Personalized Learning Teacher/Highly Qualified Teacher

If not enrolled in a class - meet with Highly Qualified Teacher weekly for onehour/week.

Student will use the text as a primary resource. Lecture, laboratory experiments,

group projects, individual and group research, oral and written presentation will be used to reinforce learning. Students will summarize each unit and answer questions about each unit, and respond to critical thinking challenges. Student will meet weekly with Personalized Learning Teacher/Highly Qualified Teacher to discuss material covered in the course, review work and to take tests, which include comprehensive midterm/final.

* **Assessments Including Methods and/or Tools**

Assessment Methods and/or Tools

Attendance at Resource Center Lab Class weekly

Oral presentations

Discussions: classroom participation and small group work.

Weekly homework assignments

Chapter/Unit tests

Comprehensive midterm/final

Assessment tools may also include the following:

Student demonstrations

Student work samples

Exams, homework assignments, discussions, oral presentations, and writing assignments are used to assess student progress. All work is corrected by the course instructor and/or Personalized Learning Teacher/Highly Qualified Teacher.

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