

## Integrated Math 1 Honors



### 9<sup>th</sup> Grade (10 Credits)

- Meets high school graduation requirement for math credits
- Meets the UC/CSU subject area "C-Mathematics" requirement

### General Information

#### Description

In **Integrated Math 1 Honors**, students will go deeper into grade level standards as well as several Pre Calculus and Integrated Math 2 standards. Student assignments will contain more critical thinking and have a higher depth of knowledge and more performance tasks. Students will learn concepts such as:

- Manipulating algebraic expressions including rearranging and collecting terms, factoring, and applying properties of exponents
- Solving and understanding equations and inequalities as a process of reasoning and explain the reason.
- Understanding the concept of a function and use function notation, domain, and range.
- Interpreting functions given graphically, numerically, symbolically, and verbally.
- Modeling and analyze various representations of functions and understanding their limitations.
- Modeling with functions using tables, equations, and graphs
- Understanding when the context allows for a model that is only an approximation.
- Constructing and comparing and linear and exponential models and solve problems.
- Looking at arithmetic sequences as linear functions and geometric sequences as exponential functions.
- Writing, interpreting, and translating among various forms of linear equations and inequalities.
- Applying laws of exponents to create and solve exponential equations.
- Summarizing, representing, and interpreting data on a single count or measurement variable and on two categorical and quantitative variables.
- Using regression techniques to describe relationships among quantities and look at residuals to analyze the goodness of fit.
- Understanding triangle congruence criteria based on analyses of rigid motions and formal constructions.
- Solving problems about triangles, quadrilaterals, and other polygons.
- Using a coordinate system to verify geometric relationships, including properties of special triangles and quadrilaterals and slopes of parallel and perpendicular lines.
- Recognizing vector quantities as having both magnitude and direction and represent appropriately using directed line segments and component form.
- Understanding the application of vectors in solving problems.
- Performing arithmetic on vectors and matrices, including addition, subtraction, finding inverses and multiplication.
- Applying matrices to represent and manipulate data and to solve systems of linear equations.
- Graphing and exploring properties of quadratic functions (finding roots, vertices, forms, and behavior).
- Exploring and performing arithmetic on complex numbers.
- Understanding rational exponents and performing operations on radical expressions.
- Working with 2x2 matrices as transformations of the plane.

As in all math courses offered at SDUHSD, students are aware of and make use of all **Standards for Mathematical Practices**:

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.

- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Students will be expected to work collaboratively as well as individually. On a regular basis, classes will include:

- Group problem solving followed by group presentations.
- Open ended problems that are applications of the content being covered.
- Challenge problems, which may consist of detailed diagrams and presentations.

### Expectations and Goals

Students should take Integrated Math 1 Honors after:

- Earning a “B” or better in Math B Honors.
- Students can sign up for Math 1 Honors after Math B but a summer bridge course is recommended.

Students entering Integrated Math 1 Honors should easily grasp higher level concepts and embrace rigorous curriculum. Students should have already mastered the following concepts

- Understanding radicals and integer exponents
- Understanding the connection between proportional relationships, lines, and linear equations.
- Solving linear equations as well as apply graphical and algebraic methods to analyze and solve systems of linear equations in two variables.
- Defining, evaluating, and comparing functions, and using them to model relationships among quantities.
- Understanding rigid motions: translations, reflections, and rotations.
- Understanding congruence and similarity using physical models, transparencies, or geometry software.
- Understanding and applying the Pythagorean Theorem
- Solving real-world and mathematical problems involving volume of cylinders, cones, and spheres.
- Working with patterns of association in bivariate data.

Students entering Integrated Math 1 Honors should also be able to solve problems such as

<p><u>System of Equations Problems:</u></p> <p>Joe solved this linear system correctly.  <math>6x + 3y = 6</math>  <math>y = -2x + 2</math>            These are the last two steps of his work.  <math>6x - 6x + 6 = 6</math>  <math>6 = 6</math>            What must be true about this linear system?</p>	<p><u>Word Problem:</u></p> <p>A company sells baseball gloves and bats. The gloves regularly cost \$30 and the bats regularly cost \$90. The gloves are on sale for \$4 off, and the bats are on sale for 10% off. The goal is to sell \$1200 worth of bats and gloves each week. Last week, the store sold 14 gloves and 9 bats. Did the store meet its goal?</p>
<p><u>Word Problem:</u></p> <p>Six friends are going to buy pizza. Their choices are to buy 2 medium 10-inch diameter pizzas for \$7 each or 1 large 14-inch diameter pizza for \$15.00. Which pizza will give them the most pizza for their money?</p>	<p><u>Pythagorean Theorem Problem:</u></p> <p>Two sides of a right triangle have lengths <math>\sqrt{10}</math> units and <math>\sqrt{6}</math> units. There are two possible lengths for the third side. What is the shortest possible side length? What is the longest possible side length?</p>

Rigid Motion and Congruence Problem:

Triangle ABC undergoes a series of some of the following transformations to become triangle DEF:

- Rotation
- Reflection
- Translation
- Dilation

- 1) Is triangle DEF always, sometimes, or never congruent to triangle ABC? Provide justification.
- 2) Is triangle DEF always, sometimes, or never similar to triangle ABC? Provide justification.

Volume Problem:

A sphere and a cone have the same volume. Each figure has a radius of 3 inches. What is the height of the cone?

**Estimated Homework**

1 hour to 1 ½ hours is expected for each class period. (This is a general guideline for planning and scheduling purposes. A student’s individual ability level and competency may affect the actual preparation times needed.)

**This Class Is Best For...**

Students should have a “B” or higher in Math B Honors. This course covers the concepts covered in Math 1 in greater depth as well as several Pre Calculus and Integrated Math 2 topics. Integrated Math 1 Honors is an accelerated and challenging course designed for students who excel in math.

**Course Materials**

**Required Materials**

Modules are adapted from The Mathematics Vision Project (see link below) using Common Core State Standards

**Internet resources**

- Course overviews, modules, standards sequencing, student help and more...

<https://sites.google.com/a/sduhsd.net/student-curriculum>

