

# Integrated Math 1 Honors

## Course Preparedness Profile & Expectations

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.

Difficulty Level: Very Difficult

Estimated Homework: 60 – 90 minutes

Prerequisites: C in Math B Honors (B is suggested), A in Math B (with Optional Summer Bridge)

Meets High School graduation requirement for mathematics

Meets UC/CSU subject area “c” requirement

Below are some guidelines for choosing the best course for an individual student. This is *not* a placement test and it should *not* be used as the only criteria for making placement decisions.

### Student Background

Students entering **Integrated Math 1 Honors** should easily grasp higher level concepts and embrace rigorous curriculum. Students should *already* have 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>

<p><u>Rigid Motion and Congruence Problem:</u></p> <p>Triangle ABC undergoes a series of some of the following transformations to become triangle DEF:</p> <ul style="list-style-type: none"> <li>▪ Rotation</li> <li>▪ Reflection</li> <li>▪ Translation</li> <li>▪ Dilation</li> </ul> <p>1) Is triangle DEF always, sometimes, or never congruent to triangle ABC? Provide justification.</p> <p>2) Is triangle DEF always, sometimes, or never similar to triangle ABC? Provide justification.</p>	<p><u>Volume Problem:</u></p> <p>A sphere and a cone have the same volume. Each figure has a radius of 3 inches. What is the height of the cone?</p>
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## Course Content and Expectations

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 x-intercepts, vertices, forms, and behavior).
- 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**:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. 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 and/or individual presentations.
- Open ended problems that are applications of the content being covered.
- Challenge problems, which may consist of detailed diagrams and presentations.