

**Students who have completed an Algebra I course and would like to be placed into a Geometry course should be able to demonstrate mastery of the following concepts and topics listed below.**

Algebra I Topics/Concepts

Place value and rounding

Fractional and Decimal number sense

Simplifying and evaluating radical & rational expressions and inequalities

Simplifying exponents, including negative and fractional exponents

Distributive property of multiplication with addition/subtraction

Manipulate equations to solve for an unknown

Linear equations in slope-intercept, point-slope, and standard forms

Algebraic and graphical determination of linear slope and intercepts

Function notation, for example  $f(x)$ ,  $f(7)$  and  $f(x) = -1$

Solving systems of linear equations using substitution and elimination

Solving word problems with linear equations and quadratic equations

Factoring, expanding, and simplifying polynomials

Solving quadratic equations using factoring, quadratic formula, completing the square, and graphical methods

Analyze the graph of a quadratic function in terms of vertex, solutions, domain, range, min/max.

Transformations of basic equations: Linear, Absolute Value, and Quadratic functions

Test for functions, identify Domain and Range of functions

**Students who have completed both an Algebra I and a Geometry course and would like to be placed into an Algebra II course should be able to demonstrate mastery of the Algebra I Topics/Concepts listed above, and the Geometry Topics/Concepts listed below.**

Geometry Topics/Concepts

Perimeter and area of shapes: rectangle, triangle, trapezoid, circle

Angles, Parallel Lines & Transversals

Similar and Congruent Figures

Triangle Congruency Theorems with proofs

Triangle Similarity Theorems with proofs

Geometric Mean

Properties of quadrilaterals and polygons

Properties of circles, including secants, tangent lines, arcs, circumcenter, incenter, and centroid

Transformations of shapes with Reflections, Translations, Rotations, Dilations, and Stretches

The Pythagorean Theorem, Distance Formula, Midpoint Formula, Special Right Triangles

Right Triangle Trigonometry: sine, cosine, and tangent

Volume & Surface Area of 3D objects including prisms, cylinders, pyramids, and cones

**Honors Courses at UA**

All students who complete the graduation requirements at Ursuline think critically and are prepared for college coursework. Our honors/AP classes are for students who truly love the subject matter and appreciate the way the subject matter sheds light on connections to the world. Honors classes require more than just “keeping up

## Ursuline Academy of Dallas Math Placement Concepts

with a faster pace;” they demand active participation with the subject matter and content. For a particular academic discipline, if a student wrestles with and wonders about the relationship between the content and the world around her, if she wants to dive deep and submerge herself in complexity, and if she appreciates the spotlight that the particular subject matter sheds on humans and humanity, then the honors/AP class in that discipline is for her. An honors student is expected to focus mostly on new material, receive and apply instruction more quickly to novel situations, be self-driven, timely with assignments, and relish and seek out challenges.

For example, below are two math statements that people often find difficult to explain. Honors students having completed Algebra I should be able to support and articulate the reasoning behind these two statements.

$$\frac{x+1}{x} \neq 1 \text{ and } \sqrt{x^2 + y^2} \neq x + y$$