St. Mary's Academy
Geometry + Algebra 2/Trig Challenge Exam Review Sheet
(To place into Pre-Calculus)

The Geometry + Algebra 2/Trig Challenge Exam is for students hoping to enroll in Pre-Calculus for their freshman year at SMA. These students must have taken Algebra 1, Geometry, and Algebra 2 in middle school. The following topics will be tested on the Geometry + Algebra 2/Trig Challenge Exam. All topics can be found in any standard Algebra 2, Trigonometry, and Geometry textbooks.

ALGEBRA 2 TOPICS:

General Topic	Specific Skills
Expressions and Equations	Order of operations Using the distributive property Combining like terms Multiplying a monomials, binomials, and polynomials Simplifying exponential expressions using the Laws of Exponents Simplifying expressions with negative and fractional exponents Simplifying and solving expressions with absolute value Solving equations including polynomial, rational, radical, and absolute value expressions
Functions	Function notation Evaluating functions given an input Finding the input given an output Domain and range Function composition Finding inverse functions algebraically, graphically
Graphing Basic Functions	Graphing linear functions in point-slope and slope-intercept from Graphing quadratic functions in standard from, factored form, and vertex form Graphing exponential functions in standard from Graphing transformations of basic parent functions including linear, parabolic, absolute value, inverse, square root, cubic, exponential, and trig functions Identifying domain and range of a function Identifying x-intercepts/roots and y-intercepts from an equation, graph
Graphing Linear Inequalities	Graphing solutions to an inequality on a number line Graphing solutions to a two-variable inequality on a graph
Solving Systems of Equations	Using substitution Using the addition/subtraction (elimination) method By graphing Writing a system and solving from a word problem
Quadratic Functions	Solving quadratic functions by factoring Solving quadratic functions using the Quadratic Formula Solving by completing the square Converting between forms of a quadratic equation (standard, factored, and vertex)

Exponential Functions	Sketching an exponential function based on an equation
	Using the initial value and growth factor to write an equation
	Solve exponential function application problems including population, depreciation, and compound interest problems
Polynomial Functions	Finding the degree of a polynomial function
	Graphing polynomial functions
	Factoring
	Polynomial division
Trigonometry	Setting up equations and solving for unknowns using right triangle trigonometry (SOH-CAH-TOA)
	Using inverse trigonometry to solve for unknown angles
	Law of Sines
	Law of Cosines
	Special Right Triangles (30-60-90) (45-45-90)
	Converting from radians to degrees and vice versa
	Unit Circle[*]
	Finding trig values with given angle measure (in degrees and radians)
Geometry	Area and perimeter
	Surface area and volume
Logarithms	Evaluating logarithmic expressions
	Laws of Logarithms
	Converting from exponential form to logarithmic form and vice versa

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[*] A Unit Circle will be provided on the Exam

Unit Circle