

**Villa Maria Academy
Mathematics Department
Topics for Algebra I Placement Test**

Operations of the Real Numbers

- Grouping symbols, order of operations
- Opposite and absolute value of a real number

Using Axioms of the Real Numbers

- Commutative, Associative, Distributive, Identity, Additive and multiplicative inverses, Reflexive, Symmetric, Transitive, Multiplicative Property of zero, Negative one, Opposite of a sum, Opposites in products, Reciprocal of a product, Definition of subtraction, Definition of division

Evaluate variable expressions

Solving Linear Equations

- Several transformations; fractional coefficients; variables on both sides;
- Literal equations (containing several variables)

Absolute Value

- Equations
- Inequalities

Monomials and Polynomials

- Addition, subtraction, division, multiplication
- FOIL method, multiplication patterns

Methods of Factoring

- GCF
- Trinomials into two binomials
- Special patterns (difference of two perfect squares, perfect square trinomials)
- Complete factorization using two or more methods

Laws of Exponents

- Multiplication, division, and powers
- Negative exponents

Graphing

- Inequalities on a number line; conjunctions and disjunctions; plot points in the plane.
- Lines, linear inequalities
- Absolute value functions
- Quadratic functions in vertex form and standard form

Linear Functions

- Standard form, slope-intercept form, point-slope form
- Slope and x- and y-intercepts
- Equations of horizontal and vertical lines; parallel lines, perpendicular lines

Functions

- Relations vs. functions, domain and range; function notation; lines of best fit

Methods of Solving Systems of Equations

- Graphing, substitution, linear combination

Square Roots and Radicals

- Simplification
- Add, subtract, multiply, divide and rationalize

Methods of Solving Quadratic Equations

- Factoring, quadratic formula, and square roots
- Evaluating the discriminant

Scientific notation

Direct Variation

Word Problems

- Translation of words into symbols, equations and inequalities
- One and two variables
- Perimeter, area, coin, number, consecutive integer, age, work, ratio, proportion