

Villa Maria Academy
Mathematics Department
Topics for Algebra I Placement Test

Operations of the Real Numbers

- Use of grouping symbols, order of operations
- Simplify the opposite and absolute value of a real number

Sets

- Union and intersection
- Express answers in set notation $\{x: x < 3\}$

Axioms of the Real Numbers

- Closure, 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; fractional equations; literal equations (containing several variables)

Absolute Value

- Solve equations; solve inequalities

Translate words into symbols, equations and inequalities

Monomials and Polynomials

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

Factorization

- Prime factorization, GCF, factoring into two binomials; factoring patterns (difference of two perfect squares, difference of two perfect cubes, perfect square trinomials, factoring by grouping); complete factorization

Laws of exponents

- Multiplication, division; simplify expressions with negative exponents

Rational Expressions

- LCD; add and subtract with like and unlike denominators; multiply, divide

Graphing

- Inequalities on number line; conjunctions and disjunctions, plot points in the plane; lines, linear inequalities

Lines

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

Functions

- Relations vs. functions, find domain and range; function notation

Solving systems of Equations

- Graphing, substitution, addition and subtraction, linear combination

Square Roots and Radicals

- Simplify; add, subtract, multiply, divide and rationalize

Solving Quadratic Equations

- Factoring; Quadratic Formula

Ratio and Proportions**Scientific notation****Direct and Inverse Variation****Word Problems**

- Set up and solve; one variable and two variable
- Perimeter, area, coin, number, consecutive integer, age, work, ratio, proportion