

ST. JOHN THE BAPTIST CATHOLIC SCHOOL

School-Wide Mathematics Curriculum – Grade 8, Algebra I

Trimester	Content	Essential State Standard	Strands	Strategies	Assessments
I	Algebra 1.0	1.0 Students identify and use the arithmetic properties of subsets of integers and rational, irrational, and real numbers, including closure properties for the four basic arithmetic operations where applicable:	1.1 Students use properties of numbers to demonstrate	Individual break down of the order of operations...PEMDAS Mastery of the "4 steps to solving equations Linear function graphing and input/output design	EXAM
I	2.0	2.0 Students understand and use such operations as taking the opposite, finding the reciprocal, taking a root, and raising to a fractional power. They understand and use the rules of exponents.		Quadratic functions using 2 nd and 3 rd degree polynomials.	EXAM
I	3.0	3.0 Students solve equations and inequalities involving absolute values.			EXAM

I	4.0	4.0 Students simplify expressions before solving linear equations and inequalities in one variable, such as $3(2x-5) + 4(x-2) = 12$.			EXAM
I	5.0	5.0 Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.			EXAM
I	6.0	6.0 Students graph a linear equation and compute the x - and y -intercepts (e.g., graph $2x + 6y = 4$). They are also able to sketch the region defined by linear inequality (e.g., they sketch the region defined by $2x + 6y < 4$).			EXAM
II	7.0	7.0 Students verify that a point lies on a line, given an equation of the line. Students are able to derive linear equations by using the point-slope formula.			EXAM

II	8.0	8.0 Students understand the concepts of parallel lines and perpendicular lines and how those slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point.			EXAM
II	9.0	9.0 Students solve a system of two linear equations in two variables algebraically and are able to interpret the answer graphically. Students are able to solve a system of two linear inequalities in two variables and to sketch the solution sets.			EXAM
II	10.0	10.0 Students add, subtract, multiply, and divide monomials and polynomials. Students solve multistep problems, including word problems, by using these techniques.			EXAM

II	11.0	11.0 Students apply basic factoring techniques to second- and simple third-degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials.			EXAM
II	12.0	12.0 Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing them to the lowest terms.			EXAM
II	13.0	13.0 Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually challenging problems by using these techniques.			EXAM

III	14.0	14.0 Students solve a quadratic equation by factoring or completing the square.			EXAM
III	15.0	15.0 Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems.			EXAM
III	16.0	16.0 Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions.			EXAM
III	17.0	17.0 Students determine the domain of independent variables and the range of dependent variables defined by a graph, a set of ordered pairs, or a symbolic expression.			EXAM

III	18.0	18.0 Students determine whether a relation defined by a graph, a set of ordered pairs, or a symbolic expression is a function and justify the conclusion.			EXAM
III	19.0	19.0 Students know the quadratic formula and are familiar with its proof by completing the square.			EXAM
III	20.0	20.0 Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations.			EXAM

III	21.0	21.0 Students graph quadratic functions and know that their roots are the x -intercepts.			EXAM
III	22.0	22.0 Students use the quadratic formula or factoring techniques or both to determine whether the graph of a quadratic function will intersect the x -axis in zero, one, or two points.			EXAM
III	23.0	23.0 Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity.			EXAM

III	24.0	<p>24.0 Students use and know simple aspects of a logical argument:</p>	<p>24.1 Students explain the difference between inductive and deductive reasoning and identify and provide examples of each.</p> <p>24.2 Students identify the hypothesis and conclusion in logical deduction.</p> <p>24.3 Students use counterexamples to show that an assertion is false and recognize that a single counterexample is sufficient to refute an assertion.</p>		EXAM
III	25.0	<p>25.0 Students use properties of the number system to judge the validity of results, to justify each step of a procedure, and to prove or disprove statements:</p>	<p>25.1 Students use properties of numbers to construct simple, valid arguments (direct and indirect) for, or formulate counterexamples to, claimed assertions.</p> <p>25.2 Students judge the validity of an argument according to whether the properties of the real number system and the order of operations have been applied correctly at each step.</p> <p>25.3 Given a specific algebraic statement involving linear, quadratic, or absolute value expressions or equations or inequalities, students determine whether the statement is true sometimes, always, or never.</p>		EXAM