Snapshot – Algebra 1

Catholic Schools DIOCESE of DALLAS

Catholic Identity Standards

A.1 **Catholic identity standards.** The student understands and integrates the content of what is learned into their faith and daily life.*

Ways to Grow

- A.1A recognize that every human life is sacred because each person is created and loved by God*
- A.1B describe ways to take part in/be responsible to the community by discerning and using our God-given gifts*
- A.1C recognize and oppose unjust social structures and work toward justice for all*
- A.1D see God at work in all things and as expressed in the sacraments*
- A.1E connect scripture, tradition, and the models of Mary and the saints to guide, grow, and deepen faith*

Mathematical Learning Process Standards

A.2 **Learning Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding, demonstrating the mental habits of precise, determined, careful, and accurate questioning, inquiry, and reasoning. *

Tools to Know		Ways to Show	
A.2A	apply mathematics to problems arising in everyday life, society, and the workplace	A.2D	create and use representations to organize, record, and communicate mathematical ideas
A.2B	use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution	A.2E	analyze mathematical relationships to connect and communicate mathematical ideas
A.2C	exhibit habits of thinking quantitatively and in an orderly manner, especially through immersion in mathematical observations found within creation *	A.2F	exhibit appreciation for the ongoing nature of mathematical inquiry and develop lines of inquiry to understand why things are true and why they are false *

Linear Functions

A.3 **Linear functions, equations, and inequalities.** The student writes and represents linear functions in multiple ways, with and without technology. The student demonstrates how sound logical arguments and other processes of mathematics are foundational to its discipline. *

Applied Standards		Supporting Standards	
A.3A	graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems	A.3A.1	determine the domain and range of a linear function in mathematical problems; determine reasonable domain and range values for real-world situations, both continuous and discrete; and represent domain and range using inequalities
		A.3A.2	determine the effects on the graph of the parent function f(x) = x when f(x) is replaced by af(x), f(x) + d, f(x – c), f(bx) for specific values of a, b, c, and d
		A.3A.3	calculate, using technology, the correlation coefficient between two quantitative variables and interpret this quantity as a measure of the strength of the linear association
		A.3A.4	evaluate functions, expressed in function notation, given one or more elements in their domains
A.3B	write linear equations in two variables given a table of values, a graph, and a verbal description	A.3B.1	write linear equations in two variables in various forms, including y = mx + b, Ax + By = C, and y – y1 = m(x – x1), given one point and the slope and given two points
		A.3B.2	write the equation of a line that contains a given point and is parallel to a given line
		A.3B.3	write the equation of a line that contains a given point and is perpendicular to a given line
		A.3B.4	write an equation of a line that is parallel or perpendicular to the x- or y-axis and determine whether the slope of the line is zero or undefined
		A.3B.5	determine the slope of a line given a table of values, a graph, two points on the line, and an equation written in various forms, including y = mx + b, Ax + By = C, and y – y1 = m(x – x1)
		A.3B.6	write a formula for the n^{th} term of arithmetic sequences, given the value of several of their terms
A.3C	solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides	A.3C.1	write and solve equations involving direct variation
		A.3C.2	solve mathematic and scientific formulas, and other literal equations, for a specified variable

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Systems of Equations and Inequalities	
A.4	**Linear functions, equations, and inequalities.** The student applies the mathematical process standards when using graphs of linear functions, key features, and related transformations to represent in multiple ways and solve, with and without technology, equations, inequalities, and systems of equations.
A.4A solve systems of two linear equations with two variables for mathematical and real-world problems	A.4A.1 write systems of two linear equations given a table of values, a graph, and a verbal description A.4A.2 graph systems of two linear equations in two variables on the coordinate plane and determine the solutions if they exist
A.4B graph the solution set of linear inequalities in two variables on the coordinate plane	A.4B.1 write linear inequalities in two variables given a table of values, a graph, and a verbal description A.4B.2 solve linear inequalities in one variable

Simplifying Expressions	
A.5	**Number and algebraic methods.** The student applies the mathematical process standards and algebraic methods to rewrite in equivalent forms and perform operations on polynomial expressions and rewrite algebraic expressions into equivalent forms.
A.5A factor, if possible, trinomials with real factors in the form ax2 + bx + c, including perfect square trinomials of degree two	A.5A.1 add and subtract polynomials of degree one and degree two A.5A.2 multiply polynomials of degree one and degree two A.5A.3 determine the quotient of a polynomial of degree one and polynomial of degree two when divided by a polynomial of degree one and polynomial of degree two A.5A.4 rewrite polynomial expressions in equivalent forms using the distributive property A.5A.5 decide if a binomial can be written as the difference of two squares and, if possible, use the structure of a difference of two squares to rewrite the binomial
A.5B simplify numeric and algebraic expressions using the laws of exponents, including integral and rational exponents	A.5B.1 simplify numerical radical expressions involving square roots

Quadratic Functions	
A.6	**Quadratic functions and equations.** The student uses graphs of quadratic functions and their related transformations to represent in multiple ways and determine the solutions to equations.
A.6A graph quadratic functions on the coordinate plane and use the graph to identify key attributes, if possible, including x-intercept, y-intercept, zeros, maximum value, minimum values, vertex, and the equation of the axis of symmetry	A.6A.1 determine the domain and range of quadratic functions and represent the domain and range using inequalities A.6A.2 determine the effects on the graph of the parent function f(x) = x2 when f(x) is replaced by af(x), f(x) + d, f(x – c), f(bx) for specific values of a, b, c, and d A.6A.3 evaluate functions, expressed in function notation, given one or more elements in their domains
A.6B solve quadratic equations having real solutions by factoring, taking square roots, completing the square, and applying the quadratic formula	A.6B.1 write equations of quadratic functions given the vertex and another point on the graph, write the equation in vertex form (f(x) = a(x – h)2 + k), and rewrite the equation from vertex form to standard form (f(x) = ax2 + bx + c) A.6B.2 describe the relationship between the linear factors of quadratic expressions and the zeros of their associated quadratic functions A.6B.3 write, using technology, quadratic functions that provide a reasonable fit to data to estimate solutions

Exponential Functions	
A.7	**Exponential functions and equations.** The student applies properties of exponential functions and their related transformations to write, graph, and represent in multiple ways exponential equations and evaluate, with and without technology, the reasonableness of their solutions.
A.7A graph exponential functions that model growth and decay and identify key features, including y-intercept and asymptote, in mathematical and real-world problems	A.7.A1 determine and represent the domain and range of exponential functions of the form f(x) = abx A.7A.2 interpret the meaning of the values of a and b in exponential functions of the form f(x) = abx in real-world problems A.7A.3 decide whether relations represented verbally, tabularly, graphically, and symbolically define a function
A.7B write exponential functions in the form f(x) = abx (where b is a rational number) to describe problems arising from mathematical and real-world situations, including growth and decay	A.7B.1 write, using technology, exponential functions that provide a reasonable fit to data A.7B.2 identify terms of geometric sequences when the sequences are given in function form using recursive processes A.7B.3 write a formula for the n^{th} term of geometric sequences, given the value of several of their terms