



Diocese of Raleigh Catholic Schools

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Math I Standards
Diocese of Raleigh
August 2017

**THE DIOCESE OF RALEIGH
MISSION OF THE CATHOLIC SCHOOLS**

The mission of the Diocese of Raleigh is to engage our school/preschool communities in creating a quality education within a Catholic environment that fosters the current and future development of the whole child.

DIOCESE OF RALEIGH CATHOLIC SCHOOLS: A FOUNDATION FOR LIFE

“School is one of the educational environments where one grows by learning how to live, how to become grown-up, mature men and women...Following what St. Ignatius teaches us, the main element in school is learning to be magnanimous...This means having a big heart, having a greatness of soul. It means having grand ideals, the desire to achieve great things in response to what God asks of us and, precisely because of this, doing everyday things, all our daily actions, commitments, and meetings with people well. [It means] doing the little everyday things with a big heart that is open to God and to others.” Pope Francis
{Excerpts from Pope Francis: Speech address on June 7, 2013 on the importance of Catholic education in schools in Italy and Albania in the Paul VI Audience Hall.}

Math

Values & Attitudes

Catholic Schools exist so that curriculum may be taught in the light of Gospel teachings. Teachers are encouraged to reinforce Gospel truths and values so that students may serve as witnesses to their Catholic faith. The values listed will assist students to develop a critical conscience in every content area. Values and attitudes are not necessarily quantifiable but rather identified in a student’s respect toward the content area.

1. All people are created with minds and the gift to reason.
2. God made each of us as a unique individual.
3. Recognize our talents and share them with one another in order to do God’s will.
4. There is a definite sense of order, balance and symmetry in God’s universe.
5. God’s world is composed of recognizable spacing, measurement and geometric design.

Mathematical Practices

“These standards describe student behaviors, ensure an understanding of math and focus on developing reasoning and building mathematical communication. Each standard has a unique focus, but each also interweaves with the others as we put them into practice. These practices empower students to use math and to think mathematically. Our job as teachers is to help students develop these practices to become effective mathematicians.”

National Council of Teachers of Mathematics

- 1) Make sense of problems and persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 3) Construct viable arguments and critique the reasoning of others.
- 4) Model with mathematics.
- 5) Use appropriate tools strategically.
- 6) Attend to precision.
- 7) Look for and make use of structure.
- 8) Look for and express regularity in repeated reasoning.
- 9) Use inductive and deductive reasoning. (Diocese of Raleigh – DOR)

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	Competency Goal 1:	Math I
The learner will solve and apply linear equations and inequalities.		
Objectives:		
1.01 Use mathematical language to describe the components of equations and inequalities	1.05 Understand the difference between compound inequalities written with <i>and</i> or with <i>or</i>	1.09 Determine the appropriate literal equation to model a word problem
1.02 Assess whether a value is a solution for an equation or an inequality	1.06 Identify methods that use the fewest number of operations and/or avoids numbers that are difficult to work with	1.10 Create equations and inequalities in one variable to model problem situations
1.03 Use appropriate properties to solve equations and inequalities	1.07 Justify the reasoning used in solving an equation or inequality by verbal or written explanation	1.11 Solve problems for specific values given a defined function
1.04 Make connection between solving multi-step equations and multi-step inequalities	1.08 Solve for a specific variable in a literal equation, using real mathematical and scientific formulas	

	Competency Goal 2:	Math I
The learner will use functions to model linear data.		
Objectives:		
2.01 Define function terminology.	2.05 Assess whether a point lies on a function and identify a point on the coordinate plane	2.09 Use function notation to write a function rule in context of an application problem
2.02 Identify relations that are functions	2.06 Represent functions using tables, equations and graphs	2.10 Represent arithmetic sequences using explicit and recursive rules
2.03 Differentiate between independent and dependent variables	2.07 Represent the concept of change, including changes in speed, altitude, distance, volume, time and other variable quantities - emphasize as a rate of change	
2.04 Classify functions as linear or nonlinear	2.08 Graph functions using a graphing calculator	

	Competency Goal 3:	Math I
The learner will interpret linear functions using their key features.		
Objectives:		
3.01 Find the slope of a line using a formula	3.06 Write an equation in point-slope form	3.11 Use direct variation to solve application problems
3.02 Find the slope of a line using a graph or a table	3.07 Write an equation in standard form	3.12 Use coordinates to find the midpoint or endpoint of a line segment
3.03 Analyze various slopes and describe their meaning	3.08 Classify lines as parallel, perpendicular or neither by using slope	3.13 Use distance formula to find perimeters and areas of triangles and rectangles
3.04 Use an equation of a line to determine slope and intercept	3.09 Analyze linear functions by key features including domain and range, intercepts, increasing and decreasing intervals, positive and negative intervals, rate of change, and end behavior (interval notation is not used at this level - inequality notation is sufficient)	3.14 Verify classifications of triangles and quadrilaterals using distance formula, midpoints, parallel and perpendicular slopes
3.05 Write an equation in slope-intercept Form	3.10 Solve linear equations and inequalities using technology	(*Trend lines and linear regressions are listed in Statistics Competencies, but can be incorporated in the unit with the study of lines)

	Competency Goal 4:	Math I
The learner will solve and apply systems of equations and inequalities.		
Objectives:		
4.01 Assess if a point is a solution to a system of equations	4.06 Determine the most appropriate method for solving a system of equations	
4.02 Solve systems of equations or inequalities by graphing and tables	4.07 Represent and solve systems of inequalities graphically	
4.03 Solve systems of equations by substitution	4.08 Create systems of linear equations and inequalities to model situations in the context of an application problem	
4.04 Solve systems of equations by elimination	4.09 Solve systems of equations by all methods to find approximate or exact solutions to an application problem	
4.05 Support, with mathematical reasoning, the process of solving by elimination	4.10 Solve systems of equations and inequalities using technology	

	Competency Goal 5:	Math I
The learner will apply exponent properties, solve and apply exponential equations, and identify key features of exponential functions.		
Objectives:		
5.01 Extend students' use of exponents to include zero and negative exponents	5.06 Analyze exponential functions by key features including domain and range, intercepts, increasing and decreasing intervals, positive and negative intervals, rate of change, and end behavior (interval notation is not used at this level - inequality notation is sufficient)	5.11 Identify a geometric sequence
5.02 Simplify exponential expressions including variables	5.07 Compare linear growth to exponential growth using two sets of data	5.12 Write both an explicit and recursive formula for a geometric sequence
5.03 Simplify radical expressions with exponents as long as the evaluations involves perfect squares and cubes	5.08 Use exponential functions to model growth and decay - compound interest, population growth, half-life, and depreciation	5.13 Recognize the differences between an arithmetic and geometric sequence
5.04 Evaluate exponential functions	5.09 Solve basic exponential equations requiring no logarithms	5.14 Compare the properties of linear and exponential functions, including rate of change, and do this with different representations (graphical, algebraic, tables)

5.05 Graph exponential functions.	5.10 Solve exponential equations using technology	(Exponential regressions are listed in Statistics Competencies, but can be incorporated in the unit with the study of exponential functions)
	Competency Goal 6:	Math I
The learner will represent, interpret, and compare data.		
Objectives:		
6.01 Find measures of central tendency and spread.	6.05 Organize data in displays such as frequency tables, histograms, scatter plots, and box-and-whisker plots.	6.09 Discuss the domain and range of functions that model data
6.02 Consider the implication of outliers and skewed data	6.06 Make a scatter plot by hand and using technology.	6.10 Use residual plot and correlation coefficient to consider the goodness of fit of linear data
6.03 Make predictions based on the data.	6.07 Approximate a trend line by hand.	
6.04 Know how analyzing data can help you make decision and predictions, including the difference between association and causation	6.08 Use regression techniques on the TI-84 calculator to fit linear and exponential graphs to data.	

	Competency Goal 7:	Math I
The learner will solve and apply quadratic equations and identify key features of quadratic functions.		
Objectives:		
7.01 Define and classify polynomials by their attributes	7.05 Solve quadratic equations by factoring, by taking the square root, and by graphing	7.09 Compare various situation models of quadratics functions - for example, the resulting functions for different initial velocity for a horizontal projectile motion problem
7.02 Add and subtract polynomial expressions, multiply monomial, binomial, and trinomial expressions, and use these operations in the context of problems such as area and perimeter of figures	7.06 Use technology to find the maximum and minimum points and the x-intercepts of a parabola	7.10 Solve systems of equations using the calculator
7.03 Sketch the graph of a quadratic manually	7.07 Identify end behavior of parabolas based on the leading coefficient of the function	
7.04 Factor quadratic expressions - GCF, trinomials including $a > 1$, and the special cases of perfect square trinomials and the difference of two perfect squares	7.08 Compare properties of linear, quadratic and exponential functions with different representations, including rates of change. Use graphs and tables.	