

## Freshman intending to take Geometry Student Expectations

Freshmen that intend to take the Algebra 1 proficiency exam are expected to show mastery in the following areas. Freshmen are also expected to show mastery of the 8<sup>th</sup> grade math concepts included in the "Freshman Entering Algebra 1" document.

### Vocabulary

Evaluate	Expression	Like terms	Linear equation	Solutions
Variable	Direct variation	Inverse variation	Collinear	Inequality
Slope	System of equations	x-intercept	y-intercept	Domain
Range	Exponential growth	Exponential decay	Monomial	Binomial
Trinomial	Polynomial	Quadratic function	Quadratic equation	Vertex
Parabola	Axis of symmetry	Maximum	Minimum	Radicand
Constant	Radical equation	Radical expression	Quadratic formula	
	Zeros of function	Roots of function		

### Linear Equations/Inequalities

Students will be able to:

- Solve multi-step equations with one variable using commutative, associative and distributive properties
- Solve equations with one variable that contain variables on both sides of the equations
- Solve an equation with two or more variables for one given variable.
- Identify the solution of an inequality with one variable and graph the solution on the number line.
- Solve compound inequalities with one variable and graph the solution on the number line.

### Functions

Students will be able to:

- Graph a given relation or function using generated points
- Find the domain and range for relations and functions
- Identify independent and dependent variables and use them to write and evaluate functions
- Use real data to create scatter plots and use trend lines to make predictions
- Identify if a relation is a function

### Linear Functions

Student will be able to:

- Identify linear functions given a graph, a table, an equation or a set of ordered pairs
- Find x- and y-intercepts and interpret their meaning in application problems
- Calculate slope and relate slope to a constant rate of change
- Write a linear equation in standard form and slope-intercept form
- Graph linear functions using slope-intercept form
- Describe how changing slope or y-intercept affect the graph of a linear function
- Write, identify, and graph equations of parallel and perpendicular lines
- Graph and solve linear inequalities in two variables
- Use linear functions to solve real-world problems

## **Systems of Linear Equations with Two Variables**

Student will be able to:

- Identify solutions of systems equations as the coordinate where the two lines intersection
- Solve systems of equation using graphing, elimination, and substitution
- Classify system of equations and determine the number of solutions
- Setup up and solve application problems using systems of equations

## **Polynomials**

Student will be able to:

- Use multiplication and division properties of exponents to simplify expressions
- Apply rules for adding, subtracting and multiplying to polynomials
- Identify and find the special products of binomials
- Factor polynomials and recognize when a polynomial is completely factored
- Factor perfect-square trinomials and the difference of two squares

## **Quadratic Functions and Equations**

Students will be able to:

- Graph a quadratic functions and give its domain and range
- Find the zeroes of a quadratic function from its graph and interpret their meaning in application problems
- Find the axis of symmetry and the vertex of a parabola and interpret their meaning in application problems
- Recognize the value of  $a$  in a quadratic function determines the direction and the width of the graph  $ax^2 + bx + c$
- Recognize the value of the constant  $c$  in a quadratic function determines the vertical translation of the graph  $ax^2 + bx + c$
- Model real world situations using quadratic functions
- Solve quadratic equations using quadratic functions, factoring, square roots, and the quadratic formula

## **Radical Expression (not tested on placement exam)**

Students will be able to:

- Simplify and recognize when a radical expression is in simplest form
- Apply rules for adding, subtracting, multiplying, and dividing to radical expressions
- Solve radical equations that contain square roots (not tested on placement test)

## **Exponential Functions (not tested on placement test)**

Students will be able to:

- Evaluate, identify, and graph exponential functions
- Setup and solve application problems involving exponential growth and decay including compound interest

## **Graphing Technology (not tested on placement test)**

Students will be able to:

- Use the graphing calculator to create graphs and interpret the meaning of graph
- Use the graphing calculator to create tables and use the table data to solve problems
- Change views and settings on the graphing calculator so that the data or graph can be displayed properly