Sophomore Algebra Standards
2015-2016
Standards in italics are considered Algebra II standards

Real Numbers and Expressions

- I can identify relationships between numbers and sets of number within the real number system.
- I can rewrite and evaluate numeric expressions with positive rational exponents.
- I can simplify square roots of non-perfect square integers and algebraic monomials.
- I can simplify algebraic rational expressions, with numerators and denominators containing monomial bases with integer exponents, to equivalent forms.
- I can factor common terms from polynomials and factor polynomials completely, factor the difference of two square, perfect square trinomials, and other quadratic expressions.

Functions

- I can identify whether a given set or graph is a function and express a function in f(x) notation.
- I can describe the functional relationship between two quantities by analyzing a graph for its key features (increasing/decreasing, family, minima/maxima)
- I can identify independent and dependent variables in a story and make predictions about a relationship.
- *I can identify the domain and range of each of the families of functions.*
- *I can understand composition of functions and combine functions using composition.*
- *I can understand the definition of an inverse function and obtain them.*
- *I can describe the effect on the graph of f(x) of various transformations and reflections.*

Linear Equations, Functions, and Inequalities

- I can write the equation of a line based on a graph, a table, a set of points, or a story. I can clearly describe the meaning of slope and y-intercept in terms of a graph.
- I can solve linear equations and inequalities in one variable fluently with integers, fractions, and decimals as coefficients. I can explain and justify each step in solving an equation.
- I can represent real-world and other mathematical problems using linear equations and inequalities in one variable, including algebraic proportions.
- I can translate among equivalent forms of equations for linear functions, including slope-intercept, point-slope, and standard form.
- I can represent real-world problems using linear inequalities in two variables and solve such problems, interpret the solution set, and determine reasonability. I can solve other linear inequalities in two variables by graphing.
- I can solve equations and formulas for a specified variable, including equations with coefficients represented by variables.

Systems of Linear Equations and Inequalities

- I can solve a system of linear equations in two variables using graphing, substitution, and elimination.
- I can interpret the solution set of a system of linear equations and determine whether it is reasonable.
- *I can solve a system of equations consisintg of a linear equation and a quadratic equation algebraically and graphically with and without technology.*

Quadratic and Exponential Functions and Equations

- I can distinguish between situations that can be modeled with linear functions and with exponential functions.

- I can represent real-world or other mathematical problems using exponential models of the form $y = ab^x$, translate fluently among the representations, and interpret the values of a and b.
- I can graph exponential and quadratic equations in two variables with and without technology.
- I can solve quadratic equations in one variable by finding the square root, using the quadratic formula, and factoring, as appropriate.
- I can represent real-world problems using quadratic equations in one or two variables and solve such problems with and without technology.
- I can use the process of factoring to determine zeros, lines of symmetry, and extreme values in real-world and other mathematical problems involving quadratic functions.
- *I can describe the relationships among the solutions of a quadratic equation, the zeros of the function, the x-intercepts of the graph, and the factors of the expression.*
- *I can use the discriminant to determine the type and number of solutions of a quadratic equation in one variable with real coefficients, find all solutions, and write complex solutions in the form of a + bi for real numbers a and b.*
- *I can write arithmetic and geometric sequences both recursively and with an explicit formula and use them to model situations and translate between the two forms.*

Data Analysis

- I can distinguish between random and non-random sampling methods, identify possible sources of bias in sampling, describe how such bias can be controlled and reduced, evaluate the characteristics of a good survey and well-designed experiment, design simple experiments or investigations to collect data to answer questions of interest, and make inferences from sample results.
- I can graph bivariate data on a scatterplot and describe the relationship between the variables.
- I can use technology and regression to find a function that models a scatterplot in ord
- er to make predictions; I can interpret key features of the graph and compute (using technology) the correlation coefficient.
- I can distinguish between correlation and causation.
- I can understand measures of center and spread and the effects of outliers on the statistical summary of the data.
- *I can apply the counting principle, permutations, and combinations to calculate probabilities.*