2016-2017

# Algebra II
# Unit 1: Sequences, Series, and Functions

**AII.EL.1:** Write arithmetic and geometric sequences both recursively and with an explicit formula; use them to model situations and translate between the two forms.

**AII.CNE.6:** Find partial sums of arithmetic and geometric series and represent them using sigma notation.

**AII.F.1:** Determine whether a relation represented by a table, graph, or equation is a function.

**AII.F.2**: Understand composition of functions and combine functions by composition.

**AII.F.3**: Understand that an inverse function can be obtained by expressing the dependent variable of one function as the independent variable of another, as f and g are inverse functions if and only if f(x)=y and g(y)=x, for all values of x in the domain of f and all values of y in the domain of g. Find the inverse of a function that has an inverse.

**AII.F.4:** Understand that if the graph of a function contains a point (a, b), then the graph of the inverse relation of the function contains the point (b, a); the inverse is a reflection over the line y = x.

**AII.EL.5:** Know that the inverse of an exponential function is a logarithmic function. Represent exponential and logarithmic functions using graphing technology and describe their inverse relationship.

**AII.F.5**: Describe the effect on the graph of f(x) by replacing f(x) with f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative) with and without technology. Find the value of k given the graph of f(x) and the graph of f(x) + k, k f(x), f(kx), or f(x + k).

2016-2017

# Algebra II
# Unit 2: Polynomial Functions & Equations

**AII.Q.1**: Represent real-world problems that can be modeled with quadratic functions using tables, graphs, and equations; translate fluently among these representations. Solve such problems with and without technology. Interpret the solutions and determine whether they are reasonable.

**AII.Q.2:** Use completing the square to rewrite quadratic functions into the form $y = a(x + h)^2 + k$, and graph these functions with and without technology. Identify intercepts, zeros, domain and range, and lines of symmetry. Understand the relationship between completing the square and the quadratic formula.

**AII.F.5:** Describe the effect on the graph of f(x) by replacing f(x) with f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative) with and without technology. Find the value of k given the graph of f(x) and the graph of f(x) + k, k f(x), f(kx), or f(x + k).

**AII.PR.1:** Solve real-world and other mathematical problems involving polynomial equations with and without technology. Interpret the solutions and determine whether the solutions are reasonable.

**AII.PR.2:** Graph relations and functions including polynomial, and piecewise-defined functions (including step functions and absolute value functions) with and without technology. Identify and describe features, such as intercepts, zeros, domain and range, end behavior, and lines of symmetry.

**AII.PR.1:** Solve real-world and other mathematical problems involving polynomial equations with and without technology. Interpret the solutions and determine whether the solutions are reasonable.

**AII.PR.2:** Graph relations and functions including polynomial, with and without technology. Identify and describe features, such as intercepts, zeros, domain and range, end behavior, and lines of symmetry.

**AII.Q.1:** Represent real-world problems that can be modeled with quadratic functions using tables, graphs, and equations; translate fluently among these representations. Solve such problems with and without technology. Interpret the solutions and determine whether they are reasonable.

**AII.Q.2:** Use completing the square to rewrite quadratic functions into the form $y = a(x + h)^2 + k$, and graph these functions with and without technology. Identify intercepts, zeros, domain and range, and lines of symmetry. Understand the relationship between

**AII.Q.3:** Use the discriminant to determine the number and type of solutions of a quadratic equation in one variable with real coefficients; find all solutions and write complex solutions in the form of $a \pm bi$ for real numbers a and b.

**AII.CNE.1:** Know there is an imaginary number, i, such that $i^2 = -1$, and every complex number can be written in the form a + bi, with a and b real. Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.

**AII.PR.1:** Solve real-world and other mathematical problems involving polynomial equations with and without technology. Interpret the solutions and determine whether the solutions are reasonable.

**AII.PR.2**: Graph relations and functions including polynomial, functions with and without technology. Identify and describe features, such as intercepts, zeros, domain and range, end behavior, and lines of symmetry.