Course: Algebra 2

Quarter 1

Unit	Days	Title	Content	Essential Questions	SMP
1.1	5	Parent Functions and Their Transformations	Apply transformations to $f(x) = x$, $f(x) = x^2$, $f(x) = x^3$, $f(x)= \text{sqrt}(x)$	What are the graphs of the parent functions? How do the transformations of functions related to each other?	
1.2	20	Quadratic Functions	Graph quadratic functions given multiple forms and identify their key features; solve quadratic equations over the complex number system; define the imaginary unit; modeling	How is the structure of a quadratic function related to the structure of the parabola it describes? How do you determine where the graph of a quadratic function crosses the x-axis? When does a quadratic equation have nonreal solutions, and how do you find them?	
1.3	10	Operations on Polynomial Expressions	Adding, subtracting, multiplying, and dividing (long and synthetic) polynomial expressions.	How are the operations over real numbers related to operations over polynomials?	

Course: Algebra 2

Quarter 2					
Unit	**Days**	**Title**	**Content**	**Essential Questions**	**SMP**
2.1	15	Polynomial Functions	Sketch graphs of polynomial functions using key features; Remainder Theorem; Factor Theorem; Fundamental Theorem of Algebra; modeling	How do you use zeros to graph polynomial functions? How can you find the zeros of polynomial functions?	
2.2	5	Inverse Functions	Determine the inverse algebraically and graphically; composition of functions; modeling	How do you find the inverse of a function, and how is the original function related to its inverse?	
2.3	15	Exponential Functions; Logarithmic Functions	Graph exponential functions; solve exponential equations; graph logarithmic functions; solve logarithmic equations; modeling	How do increasing (& decreasing) exponential functions compare to increasing (decreasing) linear functions?	

Course: Algebra 2

Quarter 3					
Unit	**Days**	**Title**	**Content**	**Essential Questions**	**SMP**
3.1	15	Rational Functions	Graph rational functions and identify key features; operations on rational expressions; modeling	How are rational expressions related to each other and inverse functions? How do you determine asymptotes and holes in graphs of rational functions? How are algebraic and numerical rational expressions simplified?	
3.2	10	Radical Functions	Extend inverse functions over polynomials to create radical functions; relate rational exponents and nth roots	How are expressions involving radicals and exponents related?	
3.3	10	Properties and Attributes of Functions	Piecewise functions; step functions; operations on functions	How are piecewise functions and step functions different from one another? When you perform operations with functions, how does the graph of the resulting function compare with the original function?	

Course: Algebra 2

Quarter 4					
Unit	**Days**	**Title**	**Content**	**Essential Questions**	**SMP**
4.3	15	Introduction to Trigonometry	Right angle trigonometry; the unit circle, graphs of sine and a cosine	How can the sine, cosine, and tangent functions be defined using the unit circle? What are the key features of the graphs of the sine, cosine, and tangent functions?	
4.1	10	Probability	Permutations; combinations; independent and dependent events; two way tables; compound events	What are permutations and combinations and how can they be used to calculate probabilities? How do you find the probability of independent and dependent events?	
4.2	10	Data and Statistics	Measures of central tendency (mean, median, mode); sampling distributions; normal distribution	How can you use shape, center, and spread to characterize a data distribution?	