HPISD Algebra II TEKS Matrix 2011-2012

	Six Weeks:	1	2	3	4	5	6

The student:
- uses properties and attributes of functions and applies functions to problem situations;
- connects algebraic and geometric representations of functions.

The student is expected to:

		1	2	3	4	5	6
Properties and Attributes of Functions	Identify the mathematical domains and ranges of functions and determine reasonable domain and range values for continuous and discrete situations. **A2.1A**	X	X	X	X		X
	Collect and organize data, make and interpret scatterplots, fit the graph of a function to the data, interpret the results, and proceed to model, predict, and make decisions and critical judgments. **A2.1B**	X		X			
	Identify and sketch graphs of parent functions, including linear ($f(x) = x$), quadratic ($f(x) = x2$), exponential ($f(x) = ax$), and logarithmic ($f(x) = \log ax$) functions, absolute value of x ($f(x) = |x|$), square root of x ($f(x) = \sqrt{x}$), and reciprocal of x ($f(x) = 1/x$). **A2.4A**	X	X	X			X
	Extend parent functions with parameters such as a in $f(x) = a/x$ and describe the effects of the parameter changes on the graph of parent functions. **A2.4B**		X	X			X
	Describe and analyze the relationship between a function and its inverse. **A2.4C**			X			

The student:
- uses properties and attributes of functions and applies functions to problem situations;
- formulates systems of equations and inequalities from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situations.

The student is expected to:

		1	2	3	4	5	6
Representational Tools to Solve Problems	Use tools including factoring and properties of exponents to simplify expressions and to transform and solve equations. **A2.2A**	X			X		X
	Use complex numbers to describe the solutions of quadratic equations. **A2.2B**	X					
	Analyze situations and formulate systems of equations in two or more unknowns or inequalities in two unknowns to solve problems. **A2.3A**	X					
	Use algebraic methods, graphs, tables, or matrices, to solve systems of equations or inequalities. **A2.3B**	X	X				
	Interpret and determine the reasonableness of solutions to systems of equations or inequalities for given contexts. **A2.3C**	X	X				

Six Weeks:	1	2	3	4	5	6

The student:
- understands that quadratic functions can be represented in different ways and translates among their various representations;
- formulates equations and inequalities based on quadratic functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation.

The student is expected to:

Properties of Quadratic Functions

	1	2	3	4	5	6
Determine the reasonable domain and range values of quadratic functions, as well as interpret and determine the reasonableness of solutions to quadratic equations and inequalities. **A2.6A**	X	X				
Relate representations of quadratic functions, such as algebraic, tabular, graphical, and verbal descriptions. **A2.6B**	X	X				
Determine a quadratic function from its roots (real and complex) or a graph. **A2.6C**		X				
Analyze situations involving quadratic functions and formulate quadratic equations or inequalities to solve problems. **A2.8A**		X				
Analyze and interpret the solutions of quadratic equations using discriminants and solve quadratic equations using the quadratic formula. **A2.8B**	X					
Compare and translate between algebraic and graphical solutions of quadratic equations; **A2.8C**	X	X				
Solve quadratic equations and inequalities using graphs, tables, and algebraic methods. **A2.8D**	X	X				

The student:
- knows the relationship between the geometric and algebraic descriptions of conic sections;
- interprets and describes the effects of changes in the parameters of quadratic functions in applied and mathematical situations.

The student is expected to:

Representations of Quadratic Functions

	1	2	3	4	5	6
Describe a conic section as the intersection of a plane and a cone. **A2.5A**					X	X
Sketch graphs of conic sections to relate simple parameter changes in the equation to corresponding changes in the graph. **A2.5B**					X	X
Identify symmetries from graphs of conic sections. **A2.5C**					X	X
Identify the conic section from a given equation. **A2.5D**					X	X
Use the method of completing the square. **A2.5E**		X				X
Use characteristics of the quadratic parent function to sketch the related graphs and connect between the $y = ax^2 + bx + c$ and the $y = a(x - h)^2 + k$ symbolic representations of quadratic functions. **A2.7A**		X			X	X
Use the parent function to investigate, describe, and predict the effects of changes in a, h, and k on the graphs of $y = a(x - h)^2 + k$ form of a function in applied and purely mathematical situations. **A2.7B**		X			X	X

Six Weeks:	1	2	3	4	5	6
The student formulates equations and inequalities based on square root functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to:						

		1	2	3	4	5	6
Properties of Square Root Functions	Use the parent function to investigate, describe, and predict the effects of parameter changes on the graphs of square root functions and describe limitations on the domains and ranges. **A2.9A**			X			
	Relate representations of square root functions, such as algebraic, tabular, graphical, and verbal descriptions. **A2.9B**			X			
	Determine the reasonable domain and range values of square root functions, as well as interpret and determine the reasonableness of solutions to square root equations and inequalities. **A2.9C**			X			
	Determine solutions of square root equations using graphs, tables, and algebraic methods. **A2.9D**			X			
	Determine solutions of square root inequalities using graphs and tables. **A2.9E**			X			
	Determine solutions of square root inequalities using graphs and tables. **A2.9F**			X			
	Connect inverses of square root functions with quadratic functions. **A2.9G**			X			

Six Weeks:	1	2	3	4	5	6
The student formulates equations and inequalities based on rational functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to:						

		1	2	3	4	5	6
Properties of Rational Functions	Use quotients of polynomials to describe the graphs of rational functions, predict the effects of parameter changes, describe limitations on the domains and ranges, and examine asymptotic behavior. **A2.10A**				X		
	Analyze various representations of rational functions with respect to problem situations. **A2.10B**				X		
	Determine the reasonable domain and range values of rational functions, as well as interpret and determine the reasonableness of solutions to rational equations and inequalities. **A2.10C**				X		
	Determine the solutions of rational equations using graphs, tables, and algebraic methods; **A2.10D**				X		
	Determine solutions of rational inequalities using graphs and tables. **A2.10E**				X		
	Analyze a situation modeled by a rational function, formulate an equation or inequality composed of a linear or quadratic function, and solve the problem. **A2.10F**				X		
	Use functions to model and make predictions in problem situations involving direct and inverse variation. **A2.10G**				X		

Six Weeks:	1	2	3	4	5	6
The student formulates equations and inequalities based on exponential and logarithmic functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to:						

		1	2	3	4	5	6
Properties of Exponential and Logarithmic Functions	Develop the definition of logarithms by exploring and describing the relationship between exponential functions and their inverses. **A2.11A**					X	
	Use the parent functions to investigate, describe, and predict the effects of parameter changes on the graphs of exponential and logarithmic functions, describe limitations on the domains and ranges, and examine asymptotic behavior. **A2.11B**					X	
	Determine the reasonable domain and range values of exponential and logarithmic functions, as well as interpret and determine the reasonableness of solutions to exponential and logarithmic equations and inequalities. **A2.11C**					X	
	Determine solutions of exponential and logarithmic equations using graphs, tables, and algebraic methods. **A2.11D**					X	
	Determine solutions of exponential and logarithmic inequalities using graphs and tables. **A2.11E**					X	
	Analyze a situation modeled by an exponential function, formulate an equation or inequality, and solve the problem. **A2.11G**					X	