

Wylie ISD Curriculum

Subject Area	Math	Bundle #:	1
Grade/Level	Pre-calculus	Weeks:	1-3
Overview			
Functions			
TEKS - Texas Knowledge & Skills			
Knowledge & Skill Statement	Student Expectation	Student Learning Outcome Clarification	
<p>P.1 defines functions, describes characteristics of functions, and translates among verbal, numerical, graphical, and symbolic representations of functions.</p>	<p>P.1B Determine the domain and range of functions using graphs, tables, and symbols</p>	<p>Write the domain and range in set notation and interval notation. Be able to determine minimum and maximum values and determine over what intervals a function is increasing, decreasing, constant or undefined. Will be able to apply vertical line test and evaluate functions and correlate with points on the graph. Be able to determine minimum and maximum values of discrete functions.</p>	
	<p>P.1C Describe symmetry of graphs of even and odd functions.</p>	<p>Be able to find the symmetry of functions and determine if the functions are even or odd.</p>	
<p>P.2 Interprets the meaning of the symbolic representations of functions and operations on functions to solve meaningful problems.</p>	<p>P.2B Perform operations including composition, find inverses, and describe these procedures and results verbally, numerically, symbolically, and graphically.</p>	<p>Student will be able to perform function operations and give appropriate domain of resultant function.</p>	

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P.3 uses functions and their properties, tools, and technology to model and solve meaningful problems	P.3C – use regression to determine the appropriateness of a linear function to model real life data.	Students will look at real life situations and develop the appropriate linear model using graphing technology and justify their answer using correlation coefficients. They will also use their model to check the accuracy of the model and make predictions of future values.
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Subject Area	Math	Bundle #:	3
Grade/Level	Pre-calculus	Weeks:	7-9

Overview

Polynomials		
TEKS - Texas Knowledge & Skills		
Knowledge & Skill Statement	Student Expectation	Student Learning Outcome Clarification
P.1 The student defines functions, describes characteristics of functions, and translates among verbal, numerical, graphical, and symbolic representations of functions, including polynomial, rational, power (including radical, exponential, logarithmic, trigonometric, and piecewise-defined functions).	<p>P.1.A Describe parent functions symbolically and graphically, including $f(x) = x^n$, $f(x) = 1/n x$, $f(x) = \log_a x$, $f(x) = 1/x$, $f(x) = e^x$, $f(x) = x$, $f(x) = a^x$, $f(x) = \sin x$, $f(x) = \arcsin x$, etc.</p> <p>P.1B Determine the domain and range of functions using graphs, tables, and symbols.</p>	<p>The student will be able to graph polynomial functions using end behavior, zeros, relative extrema, effect of negative leading coefficient.</p> <p>The student will be able to determine the domain and range of the polynomial functions and write in appropriate notation.</p>

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<p>P.3 uses functions and their properties, tools, and technology to model and solve meaningful problems</p>	<p>P.1D Recognize and use connections among significant values of a function (zeros, maximum values, minimum values, etc.), points on the graph of a function, and the symbolic representation of a function.</p>	<p>The student will be able to apply synthetic division and calculators to evaluate functions.</p> <p>The student will be able to evaluate the graph of a function to find the zeros (x-intercepts, solutions, or roots), maximum and minimum value and y-intercepts.</p> <p>The student will use the graphing calculator to find the value of the function at any given domain value using the table, graph, or use VARS menu to evaluate $y_1(a)$ if $x = a$</p> <p>Relate the vertex of a parabola to the idea of maximum (concave down) and minimum (concave up) and be able to find this point algebraically by using the formula $-b/(2a)$ or by completing the square.</p>
	<p>P.3A Investigate properties of trigonometric and polynomial functions</p>	<p>The student will use properties, tools, and technology to model and solve meaningful problems.</p> <p>The student will find roots using long division, synthetic division and calculator as appropriate.</p> <p>The student will find the roots (zeros, solutions, and x-intercepts) by graphing the polynomial. Confirm the values are roots by using direct substitution, synthetic division and remainder theorem or table values</p>

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		<p>The student will connect roots to the function value of zero.</p> <p>The student will use the roots and synthetic division to factor a polynomial in order to find irrational and imaginary roots.</p>
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Subject Area	Math	Bundle #:	4
Grade/Level	Pre-calculus	Weeks:	10-12

Overview

Rational and Radical functions		
TEKS - Texas Knowledge & Skills		
Knowledge & Skill Statement	Student Expectation	Student Learning Outcome Clarification
<p>P.1 The student defines functions, describes characteristics of functions, and translates among verbal, numerical, graphical, and symbolic representations of functions, including polynomial, rational, power (including radical), exponential, logarithmic, trigonometric, and piecewise-defined functions.</p>	<p>P.1A Describe parent functions symbolically and graphically, including $f(x) = x^n$, $f(x) = \ln x$, $f(x) = \log_a x$, $f(x) = x$, $f(x) = a^x$, $f(x) = \sin x$, $f(x) = \arcsin x$, etc.</p>	<p>The student will be able to graph rational functions using asymptotes and intercepts with and without calculator.</p> <p>Identify the sketch of a given parent function and label appropriately</p> <p>Recognize a function by a verbal description in a problem solving situation</p> <p>Recognize parent functions from values displayed in a table or a graph</p> <p>Recognize parent functions from equations</p> <p>The student will use the asymptotes to find domain and range.</p>

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		<p>Connect continuous functions to the graph and to the equation</p> <p>Discuss discontinuous as a step function or jump, holes and asymptotes.</p> <p>Use "<i>removable</i>" for point discontinuity, "<i>non-removable</i>" for jumps and asymptotes.</p> <p>Use the concept of infinity at a discontinuity (vertical and horizontal asymptotes)</p> <p>Describe end behavior as what the graph is doing when the x value increases without bound positively or negatively. (Use graphing calculator)</p> <p>Use intuitive and informal approach to finding limits-primarily from the graph.</p> <p>Use horizontal asymptotes to determine the end behavior of rational functions</p> <p>The student will understand the concepts of continuity, end behavior and limits as it relates to vertical and horizontal asymptotes of rational functions.</p>
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<p>P.3 Use functions including logarithmic, exponential, trigonometric, polynomial, etc. to model real-life data Including but not limited to: Use each type of function in a real-life problem solving situation</p>	<p>P.3C Use regression to determine the appropriateness of a linear function to model real-life data (including using technology to determine the correlation coefficient)</p> <p>P.3D Use properties of functions to analyze and solve problems to make predictions;</p>	<p>Connect equations to problem situations</p> <p>Connect the solution to an equation to a graphical solution</p> <p>Connect the equation to possible predicted value (estimate)</p>
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Subject Area	Math	Bundle #:	5
Grade/Level	Pre-calculus	Weeks:	13-15
Overview			
Exponential and Logarithmic Functions			
TEKS - Texas Knowledge & Skills			
Knowledge & Skill Statement	Student Expectation	Student Learning Outcome Clarification	
<p>P.1 The student defines functions, describes characteristics of functions, and translates among verbal, numerical, graphical, and symbolic representations of functions, including polynomial, rational, power (including radial), exponential, logarithmic, trigonometric, and piecewise-defined functions.</p>	<p>P.1A Describe parent functions symbolically and graphically, including $f(x) = x^n$, $f(x) = \ln x$, $f(x) = \log_a x$, $f(x) = x$, $f(x) = a^x$, $f(x) = \sin x$, $f(x) = \arcsin x$, etc.</p>	<p>Graph the exponential and logarithmic functions with and without a graphing calculator</p> <p>Identify the sketch of a given parent function and label appropriately</p> <p>Derive a function from a table of values using the statistical function of a graphing calculator.</p> <p>Recognize a function by a verbal description in a problem solving situation. Recognize parent functions from values displayed in a table or a</p>	

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	<p>P.1B Determine the domain and range of functions using graphs, tables, and symbols.</p>	<p>graph</p> <p>Recognize parent functions from equations.</p> <p>Recognize parent functions from values in a verbal description of everyday experiences including temperature, money, height, etc.</p> <p>Distinguish the difference between domain and range of an exponential and logarithmic functions and in the context of a given problem situation. Discover the inverse relationship for domain and range of exponential and logarithmic function.</p> <p>Connect domain and range with the concept of independent and dependent variables</p> <p>Describe domain of exponential and logarithmic functions and arrange with inequality notation, interval notation, and verbal descriptions</p> <p>Determine the domain and range for a parent exponential or logarithmic function and a transformed parent function</p>
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Subject Area	Math	Bundle #:	6
Grade/Level	Pre-calculus	Weeks:	16-18
Overview			
Sequences and Series			
TEKS - Texas Knowledge & Skills			
Knowledge & Skill Statement	Student Expectation	Student Learning Outcome Clarification	
P.4 The student uses sequences and series as well as tools and technology to represent, analyze, and solve real-life problem	P.4A Represent patterns using arithmetic and geometric sequences and series;	<p>The student will identify a pattern as arithmetic or geometric</p> <p>The student will use the definitions for sequence and series and appropriate notation</p> <p>The student will use appropriate vocabulary of common difference and common ratio</p>	
	P4.B Use arithmetic, geometric, and other sequences and series to solve real-life problems.	<p>The student will solve problems algebraically and graphically or by continuation of a pattern</p>	
	P.4C Describe limits of sequences and apply their properties to investigate convergent and divergent series;	<p>The student will distinguish between a divergent and convergent series</p> <p>The student will determine what value a sequence is approaching</p> <p>The student will find the sum of series – arithmetic, geometric, finite and infinite</p>	

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	<p>P.4D Apply sequences and series to solve problems including sums and binomial expansion.</p>	<p>The student will compare the expansion up to $(a + b)^5$ to patterns in Pascal's Triangle</p> <p>The student will connect the n^{th} term in a pattern to the formula</p> <p>The student will perform investigations including e^x as a sum of polynomial terms—using a graphing calculator</p>
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Subject Area	Math	Bundle #:	7
Grade/Level	Pre-calculus	Weeks:	19-21
Overview			
Trigonometric Functions			
TEKS - Texas Knowledge & Skills			
Knowledge & Skill Statement	Student Expectation	Student Learning Outcome Clarification	
<p>P.1 The student defines functions, describes characteristics of functions, and translates among verbal, numerical, graphical, and symbolic representations of functions, including polynomial, rational, power (including radical, exponential, logarithmic, trigonometric, and piecewise-defined functions).</p>	<p>P.1A Describe parent functions symbolically and graphically, including $f(x) = x^n$, $f(x) = 1/n x$, $f(x) = \log_a x$, $f(x) = 1/x$, $f(x) = e^x$, $f(x) = x$, $f(x) = a^x$, $f(x) = \sin x$, $f(x) = \arcsin x$, etc</p> <p>P.1B Determine the domain and range of functions using graphs, tables, and symbols.</p>	<p>The student will be able to graph trigonometric functions with and without calculator.</p> <p>The student will distinguish the difference between domain and range of a trigonometric function and in the context of a given problem situation</p>	

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	<p>P.1D Recognize and use connections among significant values of a function (zeros, maximum values, minimum values, etc.), points on the graph of a function, and the symbolic representation of a function.</p>	<p>The student will be able to connect domain and range with the concept of independent and dependent variables</p> <p>The student describe domain and arrange with inequality notation, interval notation, and verbal descriptions</p> <p>The student will determine the domain and range for a parent function and a transformed parent function</p> <p>The student will determine the domain and range from a graph and determine the domain and range from given data</p> <p>The student will be able to evaluate trigonometric functions with and without (exact values) calculator.</p> <p>The student will use the graph of a function to find the zeros (x-intercepts, solutions, or roots), maximum and minimum value and y-intercepts</p> <p>The student will use the graphing calculator to find the value of the function at any given domain value using the table, graph, or use VARS menu to evaluate $y_1(a)$ if $x = a$</p> <p>The student will be able to construct a unit circle.</p>
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<p>P.3 Use functions including logarithmic, exponential, trigonometric, polynomial, etc. to model real-life data</p>	<p>P.3A Investigate the properties of trigonometric and polynomial functions.</p>	<p>The student will determine the symmetry of a trigonometric function and whether the function is even or odd.</p>
	<p>P.3B Use functions such as logarithmic, exponential, trigonometric, polynomial, etc. to model real life data.</p>	<p>The student will be able to determine the correct model for a trigonometric situation.</p> <p>The student will be able to convert from degrees-minutes-seconds to decimal degrees and vice versa.</p> <p>The student will be able to determine the length of the arc and the area of a sector and use in real life problems.</p>

Subject Area	Math	Bundle #:	8
Grade/Level	Pre-calculus	Weeks:	22-24
Overview			
Inverse Trigonometric Functions			
TEKS - Texas Knowledge & Skills			
Knowledge & Skill Statement	Student Expectation	Student Learning Outcome Clarification	
<p>P.1 The student defines functions, describes characteristics of functions, and translates among verbal, numerical, graphical, and symbolic representations of functions, including polynomial, rational, power (including radical, exponential, logarithmic,</p>	<p>P.1A Describe parent functions symbolically and graphically, including $f(x) = x^n$, $f(x) = 1/x$, $f(x) = \log_a x$, $f(x) = e^x$, $f(x) = x$, $f(x) = a^x$, $f(x) = \sin x$, $f(x) = \arcsin x$, etc</p>	<p>The student will be able to graph inverse trigonometric functions with and without calculator.</p>	

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	values of a function (zeros, maximum values, minimum values, etc.), points on the graph of a function, and the symbolic representation of a function.	maximum and minimum value and y-intercepts The student will use the graphing calculator to find the value of the function at any given domain value using the table, graph, or use VARS menu to evaluate $y_1(a)$ if $x = a$
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Subject Area	Math	Bundle #:	9
Grade/Level	Pre-calculus	Weeks:	25-27

Overview

Trigonometric Identities, proof, solving

TEKS - Texas Knowledge & Skills

Knowledge & Skill Statement	Student Expectation	Student Learning Outcome Clarification
P.2 Interprets the meaning of the symbolic representations of functions and operations on functions to solve meaningful problems	P.2C Investigate identities graphically and verify them symbolically, including logarithmic properties, trigonometric identities, and exponential properties.	The student will be able to use trigonometric identities to prove other trigonometric identities. The student will be able to verify identities using the calculator.
P.3 The student uses functions and their properties, tools and technology, to model and solve meaningful problems.	P.3A Investigate properties of trigonometric and polynomial functions	The student will know all trigonometric identities and be able to use them to find exact values of other trigonometric values.
	P.3D Use properties of functions to analyze and solve problems and make predictions.	The student will be able to use trigonometric identities to solve trigonometric equations.

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Subject Area	Math	Bundle #:	10
Grade/Level	Pre-calculus	Weeks:	28-30
Overview			
Trigonometric Applications			
TEKS - Texas Knowledge & Skills			
Knowledge & Skill Statement	Student Expectation	Student Learning Outcome Clarification	
P.3 The student uses functions and their properties, tools and technology, to model and solve meaningful problems.	P.3E Solve problems from physical situations using trigonometry, including the Law of Sines, Law of Cosines, and area formulas and incorporate radian measure where needed.	<p>The student will use problem situations involving right triangle trig, as well as Law of Sines and Law of Cosines and trigonometric area formulas.</p> <p>The students will know which formulas require radians as compared to degrees—including length of an arc and area of sector</p> <p>The student will apply SOHCAHTOA to right triangle trigonometry problems.</p>	

Subject Area	Math	Bundle #:	11
Grade/Level	Pre-calculus	Weeks:	31-33
Overview			
Conic Sections			
TEKS - Texas Knowledge & Skills			
Knowledge & Skill Statement	Student Expectation	Student Learning Outcome Clarification	
P.5 The student uses conic sections, their properties, and parametric representations, as well as tools and technology, to model physical situations.	P.5A Use conic sections to model motion, including the graph of velocity vs. position of a pendulum and motions of planets.	The student will gather data and apply the appropriate conic section as a model of that problem situation; ie, projectiles, planetary orbits, trajectory of comets.	

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	P.5B Use properties of conic sections to describe physical phenomena including the reflective properties of light and sound.	The student will be able to describe the properties of conic sections with respect to such phenomena as sonic booms, satellite dishes, headlights, light emitted by a lamp, nuclear cooling towers, light emitted by a flashlight, and planetary orbits
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Subject Area	Math	Bundle #:	12
Grade/Level	Pre-calculus	Weeks:	34-36

Overview

Vectors, Parametrics, Polar

TEKS - Texas Knowledge & Skills

Knowledge & Skill Statement	Student Expectation	Student Learning Outcome Clarification
P.5 The student uses conic sections, their properties, and parametric representations, as well as tools and technology, to model physical situations.	P.5C Convert between parametric and rectangular forms of functions and equations to graph them;	<p>The student will identify the need for parametric equations</p> <p>The student will compare and contrast graphs of parametric and rectangular equations</p> <p>The student will convert simple rectangular equations to parametric equations and vice versa.</p>
	P.5D Use parametric functions to simulate problems involving motion;	The student will utilize the simultaneous graph mode of a graphing calculator to compare and contrast parametric functions such a projectile motion

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<p>P.6 The student uses vectors to model physical situations.</p>	<p>P.6A Use the concept of vectors to model situations defined by magnitude and direction;</p> <p>P. 6B Analyze and solve vector problems generated by real-life situations.</p>	<p>The student will recognize the connection between absolute value and magnitude.</p> <p>The student will recognize the connection between rays and direction</p> <p>The student will apply vector principles to real world situations including but not limited to ropes attached to a weight and aircraft flight paths</p> <p>The student will be able to graph polar forms of equations.</p> <p>The student will be able to convert from polar to rectangular form and vice versa.</p> <p>The student will be able to identify the types of polar graphs, e.g. spiral of Archimedes, roses, lemniscates, limacons, cardioids.</p>
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