



**Precalculus**  
**Year at a Glance (YAG)**  
**2021-2022**



First Semester		Second Semester	
<b>1<sup>st</sup> Nine Weeks – 40 days</b> (August 19 <sup>th</sup> – October 15 <sup>th</sup> ) <i>(September 2<sup>nd</sup> – Labor day – No School)</i> <i>(October 14<sup>th</sup> – Staff Development)</i>		<b>3<sup>rd</sup> Nine Weeks – 45 days</b> (January 6 <sup>th</sup> – March 17 <sup>th</sup> ) <i>(January 20<sup>th</sup> – MLK – No School)</i> <i>(March 9<sup>th</sup> – 13<sup>th</sup> – Spring Break)</i>	
<p><b>TEKS</b>  <a href="#">P.1A, P.1B, P.1C, P.1D, P.1E, P.1F, P.1G, P.2A, P.2B, P.2C, P.2D, P.2E, P.2F, P.2G, P.2I, P.3A</a></p> <p><a href="#">P.1A, P.1B, P.1C, P.1D, P.1E, P.1F, P.1G, P.2E, P.2G, P.2I, P.2J, P.2M, P.2N, P.5G, P.5H, P.5I, P.5L</a></p>	<p><b>Chapter 1 (1.1-1.6): Functions and Mathematical Models (20 days)</b></p> <ul style="list-style-type: none"> <li>Work with functions that are defined graphically, algebraically, numerically, or verbally.</li> <li>Make connections among the algebraic equation for a function, its name, and its graph.</li> <li>Transform a given pre-image function so that the result is a graph of the image function that has been dilated by given factors and translated by given amounts.</li> <li>Given two functions, graph and evaluate the composition of one function with the other.</li> <li>Given a function, find its inverse relation, and tell whether the inverse relation is a function. Graph parametric equations on a grapher, and use parametric equations to graph the inverse of a function.</li> <li>Given a function, transform it by reflection.</li> </ul> <p><b>Chapter 2 (2.1-2.6): Properties of Elementary Functions (13 days)</b></p> <ul style="list-style-type: none"> <li>Discover patterns in the graphs of linear, quadratic, power, and exponential functions.</li> <li>Given the graph of a function, know whether the function is exponential, power, quadratic, or linear and find the particular equation algebraically.</li> <li>Given a set of regularly spaced x-values and the corresponding y-values, identify which type of function they fit (linear, quadratic, power, or exponential).</li> <li>Find other function values without necessarily finding the particular equation.</li> <li>Learn the properties of base-10 logarithms.</li> <li>Use logarithms with base 10 or other bases to solve exponential or logarithmic equations.</li> <li>Show that logarithmic functions have the multiply-add property,</li> </ul>	<p><b>TEKS</b>  <a href="#">P.1A, P.1B, P.1C, P.1D, P.1E, P.1F, P.1G, P.2G, P.2I, P.2O, P.2P, P.4C, P.4D, P.4E, P.4F</a></p> <p><a href="#">P.1A, P.1B, P.1C, P.1D, P.1E, P.1F, P.1G, P.2E, P.2G, P.2H, P.2I, P.2O, P.2P, P.4A, P.4B, P.4C, P.4D, P.4E, P.4F, P.5N</a></p>	<p><b>Chapter 5 (5.1-5.5): Periodic functions and Right Triangle Problems (13 days)</b></p> <ul style="list-style-type: none"> <li>Find the function that corresponds to the graph of a sinusoid and graph it on your grapher.</li> <li>Given an angle of any measure, draw a picture of that angle.</li> <li>Extend the definitions of sine and cosine to any angle.</li> <li>Be able to find values of the six trigonometric functions approximately, by calculator, for any angle and exactly for certain special angles.</li> <li>Given two sides of a right triangle or a side and an acute angle, find measures of the other sides and angles.</li> </ul> <p><b>Chapter 6 (6.1-6.8): Applications of Trigonometric and Circular Functions (26 days)</b></p> <ul style="list-style-type: none"> <li>Learn the meanings of amplitude, period, phase displacement, and cycle of a sinusoidal graph.</li> <li>Given any one of these sets of information about a sinusoid, find the other two:               <ul style="list-style-type: none"> <li>the equation</li> <li>the graph</li> <li>the amplitude, period or frequency, phase displacement, and sinusoidal axis</li> </ul> </li> <li>Plot the graphs of the tangent, cotangent, secant, and cosecant functions, showing their behavior when the function value is undefined.</li> <li>Given an angle measure in degrees, convert it to radians, and vice versa.</li> <li>Given an angle measure in radians, find trigonometric function values.</li> <li>Learn about the circular functions and their relationship to trigonometric functions.</li> <li>Given the equation of a circular or trigonometric function and a particular value of y, find</li> </ul>



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<p><a href="#">P.1A</a>, <a href="#">P.1B</a>, <a href="#">P.1C</a>,  <a href="#">P.1D</a>, <a href="#">P.1E</a>, <a href="#">P.1F</a>,  <a href="#">P.1G</a>, <a href="#">P.2I</a>, <a href="#">P.2N</a></p>	<p>and find particular equations algebraically.</p> <p><b>Chapter 3 (2.7, 3.1, 3.3): Fitting Functions to Data</b> (5 days)</p> <ul style="list-style-type: none"> <li>Fit a logistic function to data for restrained growth.</li> <li>Find the equation of the best-fitting linear function for a set of points by running a linear regression on your grapher.</li> <li>Given a set of data, make a scatter plot, identify the type of function that could model the relationship between the variables, and use regression to find the particular equation that best fits the data.</li> </ul>		<p>specified values of <math>x</math> or <math>\theta</math> graphically, numerically, and algebraically.</p> <ul style="list-style-type: none"> <li>Given a verbal description of a periodic phenomenon, write an equation using the sine or cosine function and use the equation as a mathematical model to make predictions and interpretations about the real world.</li> <li><b>**Given information about a rotating object or connected rotating objects, find linear and angular velocities of points on the objects.</b></li> </ul>
<p><b>2<sup>nd</sup> Nine Weeks – 43 days</b>          (October 16<sup>th</sup> – December 20<sup>th</sup>)          (November 25<sup>th</sup> – 29<sup>th</sup> – Thanksgiving Break)          (December 23<sup>rd</sup> – January 3<sup>rd</sup> – Holiday Break)</p>		<p><b>4<sup>th</sup> Nine Weeks – 45 days</b>          (March 18<sup>th</sup> – May 21<sup>st</sup>)          (April 10<sup>th</sup> – Good Friday – No School)          (April 24<sup>th</sup> – Battle of Flowers – No School)          (May 25<sup>th</sup> – Memorial Day – No School)</p>	
<p><b>TEKS</b>  <a href="#">P.1A</a>, <a href="#">P.1B</a>, <a href="#">P.1C</a>,  <a href="#">P.1D</a>, <a href="#">P.1E</a>, <a href="#">P.1F</a>,  <a href="#">P.1G</a>, <a href="#">P.2E</a>, <a href="#">P.2G</a>,  <a href="#">P.2I</a>, <a href="#">P.2J</a>, <a href="#">P.2K</a>,  <a href="#">P.2L</a>, <a href="#">P.2M</a>, <a href="#">P.2N</a>,  <a href="#">P.5J</a></p> <p><a href="#">P.1A</a>, <a href="#">P.1B</a>, <a href="#">P.1C</a>,  <a href="#">P.1D</a>, <a href="#">P.1E</a>, <a href="#">P.1F</a>,  <a href="#">P.1G</a>, <a href="#">P.5A</a>, <a href="#">P.5B</a>,  <a href="#">P.5C</a>, <a href="#">P.5D</a>, <a href="#">P.5E</a>,  <a href="#">P.5F</a></p>	<p><b>Chapter 4 (4.1-4.7): Polynomial and Rational Functions</b> (21 days)</p> <ul style="list-style-type: none"> <li>Discover some properties of polynomial and rational functions and their graphs.</li> <li>Review the properties, graphs, and techniques associated with quadratic functions.</li> <li>Given a polynomial function,             <ul style="list-style-type: none"> <li>determine from the graph what degree it might be, and vice versa.</li> <li>find the zeros from the equation or the graph.</li> </ul> </li> <li>Given a set of points, find the equation for the polynomial function that fits the data exactly or fits best for a given degree.</li> <li>Discover some properties of polynomial and rational functions and their graphs.</li> <li>Multiply, divide, add, and subtract rational expressions, and resolve proper algebraic fractions into the sum of two or more partial fractions.</li> <li>Given a rational algebraic function <math>f</math>, find <math>x</math> for a given value of <math>f(x)</math>.</li> </ul> <p><b>Chapter 15 (15.1-15.3): Sequences and Series</b> (14 days)</p> <ul style="list-style-type: none"> <li>Given a few terms in a sequence or series of numbers, find more terms.</li> <li>Given a series, find the sum of a specified number of terms.</li> </ul>	<p><b>TEKS</b>  <a href="#">P.1A</a>, <a href="#">P.1B</a>, <a href="#">P.1C</a>,  <a href="#">P.1D</a>, <a href="#">P.1E</a>, <a href="#">P.1F</a>,  <a href="#">P.1G</a>, <a href="#">P.2H</a>, <a href="#">P.2I</a>,  <a href="#">P.2O</a>, <a href="#">P.2P</a>, <a href="#">P.4A</a>,  <a href="#">P.4E</a>, <a href="#">P.4F</a>, <a href="#">P.5M</a>,  <a href="#">P.5N</a></p> <p><a href="#">P.1A</a>, <a href="#">P.1B</a>, <a href="#">P.1C</a>,  <a href="#">P.1D</a>, <a href="#">P.1E</a>, <a href="#">P.1F</a>,  <a href="#">P.1G</a>, <a href="#">P.4E</a>, <a href="#">P.4G</a>,  <a href="#">P.4H</a></p>	<p><b>Chapter 7/8 (7.1-7.4, 8.3, 8.6): Trigonometric Function Properties and Identities/Properties of Combined Sinusoids</b> (20 days)</p> <ul style="list-style-type: none"> <li>Investigate the sum of the squares of the cosine and sine of the same argument.</li> <li>Derive algebraically three kinds of properties expressing relationships among trigonometric functions.</li> <li>Given a trigonometric expression, transform it into an equivalent expression whose form is perhaps simpler or more useful.</li> <li>Find algebraically or numerically the solutions to equations involving circular or trigonometric sines, cosines, and tangents of one argument.</li> <li><b>**For trigonometric functions <math>f</math>, derive and learn properties for</b> <ul style="list-style-type: none"> <li><math>f(-x)</math> in terms of <math>f(x)</math></li> <li><math>f(90^\circ - \theta)</math> in terms of functions of <math>\theta</math>, or</li> <li><math>f(\frac{\pi}{2} - x)</math> in terms of functions of <math>x</math></li> <li><math>f(A + B)</math> and <math>f(A - B)</math> in terms of functions of <math>A</math> and functions of <math>B</math></li> </ul> </li> <li><b>**Derive formulas for <math>\cos 2A</math>, <math>\sin 2A</math>, and <math>\tan 2A</math> in terms of functions of <math>A</math>.</b></li> </ul> <p><b>Chapter 9 (9.1-9.5, 9.7): Triangle Trigonometry</b> (10 days)</p>



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- Represent sequences explicitly and recursively.
- Find a term in a sequence given its term number.
- Find the term number of a given term in a sequence
- Given a series, find a specified partial sum, or find the number of terms if the partial sum is given.
- Use sigma notation to write partial sums.
- Given a power of a binomial, expand it as a binomial series.

[P.1A](#), [P.1B](#), [P.1C](#),  
[P.1D](#), [P.1E](#), [P.1F](#),  
[P.1G](#), [P.4E](#), [P.4H](#),  
[P.4I](#), [P.4J](#), [P.4K](#)

- Given two sides and the included angle of a triangle, find by direct measurement the length of the third side of the triangle.
- Given two sides and the included angle of a triangle, derive and use the law of cosines to find the length of the third side.
- Given three sides of a triangle, find an angle measure.
- Given the measures of two sides and the included angle, or the measures of all three sides, find the area of the triangle.
- Given the measure of angle angle, the length of the side opposite this angle, and one other piece of information about a triangle, find the other side lengths and angle measures.
- Given two sides and an non-included angle, calculate the possible lengths of the third side.
- Given a real-world problem, identify a triangle and use the appropriate technique to calculate unknown side lengths and angle measures.

**Chapter 9.6: Vectors (10 days)**

- *\*\*Given the components of a vector, find the magnitude and direction.*
- *\*\*Given the magnitude and direction of a vector, find the components.*
- *\*\*Given the components of a vector, add, subtract, and multiply vectors.*
- *\*\*Given the magnitude and direction of a vector, find the components as well as the magnitude and direction of the resultant.*
- *\*\*Given a direction, convert it to navigational bearings.*
- *\*\*Given navigational bearings, convert it to a direction.*
- *\*\*Given the magnitude and bearing of a vector, find the components as well as the magnitude and bearing of the resultant.*



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Resources

1st Nine Weeks	2nd Nine Weeks	3rd Nine Weeks	4th Nine Weeks
<ul style="list-style-type: none"><li>textbook: <a href="#">Precalculus with Trigonometry Concepts and Applications</a></li></ul>	<ul style="list-style-type: none"><li>textbook: <a href="#">Precalculus with Trigonometry Concepts and Applications</a></li></ul>	<ul style="list-style-type: none"><li>textbook: <a href="#">Precalculus with Trigonometry Concepts and Applications</a></li><li>**<a href="#">CSCOPE</a></li></ul>	<ul style="list-style-type: none"><li>textbook: <a href="#">Precalculus with Trigonometry Concepts and Applications</a></li><li>**<a href="#">CSCOPE</a></li></ul>