

**Curriculum Map**  
**Pine Eagle School District**  
**Grade Level/Benchmark: 11,12/PASS**



**Teacher: Skorney**  
**Subject: Precalculus**

Units and Lessons	Time Period	Standards Addressed	Assessment	Lesson Objective
Upon completion a student will be able to:				
Functions	1st Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Decide whether a relation is a function. Evaluate functions. Find the domain of functions.
Graphs of function	1st Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Find the domain and ranges of functions. Use the vertical line test for functions. Determine intervals over which functions increase or decrease. Determine the relative maximum and minimum values of functions. Identify step, piecewise, even and odd functions.
Shifting, reflecting, and stretching graphs	1st Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Recognize graphs of common functions. Use vertical and horizontal shifts, reflections, and nonrigid transformations to graph functions.
Combinations of functions	1st Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Add, subtract, multiply, and divide functions. Find the composition of two functions.

Inverse functions	1st Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Find the inverse of a function and verify that functions are inverses of each other. Use the graph of two functions to determine whether or not they are inverse functions.
Quadratic functions	1st Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Analyze graphs of quadratic functions. Write quadratic functions in standard form.
Polynomial functions of higher degrees	1st Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use transformations to sketch graphs of polynomial functions. Use the leading coefficient test to determine end behavior of functions. Find and use zeros of functions and the intermediate value theorem to graph functions.
Real zeros of polynomial functions	1st Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use long and synthetic division to divide polynomials. Use the remainder and factor theorems. Use the rational zero test to solve polynomials. Determine the upper and lower bounds for zeros of a function.
Complex numbers	1st Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Add, subtract, multiply, and divide complex numbers. Find and use complex conjugates. Graph complex numbers.
The fundamental theorem of algebra	1st Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use the fundamental theorem of algebra to find the number of zeros of any polynomial function. Find all of the zeros of polynomial functions.

Rational functions and asymptotes	1st Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Find domains and ranges of rational functions. Find horizontal and vertical asymptotes of rational functions.
Graphs of rational functions	1st Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Analyze graphs of rational functions. Find equations of slant asymptotes.
Exponential functions and their graphs	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Evaluate exponential functions with various bases. Graph exponential functions.
Logarithmic functions and their graphs	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Evaluate and graph logarithmic functions with various bases.
Properties of logarithms	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Rewrite logarithmic functions using properties of logarithms.
Solving exponential and logarithmic equations	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Solve exponential and logarithmic equations.
Exponential and logarithmic models	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Recognize and graph the 5 most common types of exponential and logarithmic functions. Fit exponential and logarithmic models to sets of data.
Radian and degree measure	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Describe, and use radian and degree measures of angles.
Trigonometric functions and the unit circle	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Evaluate trigonometric functions using the unit circle and a calculator.
Right triangle trigonometry	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Evaluate trigonometric functions of acute angles.
Trigonometric functions of any angle	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Evaluate trigonometric functions of any angle by using reference angles.
Graphs of sine and cosine	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use amplitude and period to graph sine and cosine functions and their translations. Use graphs of sine and cosine to model real-life data.

Graphs of other trigonometric functions	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Graph tangent, cotangent, secant, and cosecant, and damped trigonometric functions.
Inverse trigonometric functions	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Evaluate and graph inverse trigonometric functions.
Applications and models of trigonometric functions	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Solve real-life problems involving right triangles, directional bearings and harmonic motion.
Fundamental trigonometric identities.	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use fundamental trigonometric identities to evaluate, simplify and solve equations and expressions.
Verifying trigonometric identities	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	How to verify trigonometric identities.
Solving trigonometric equations	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Solve trigonometric equations using algebraic and inverse trigonometric methods.
Angle sum and difference formulas	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use the angle sum and difference formulas to evaluate trigonometric functions and solve equations.
Multiple-angle and product-sum formulas	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use the multiple-angle, power reducing, and product-sum formulas to rewrite, evaluate, and solve trigonometric expressions and equations.
Law of sines	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use the law of sines to find the missing components of triangles and their areas.
Law of cosines	2nd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use the law of cosines to find the missing components of triangles.

Vectors in the plane	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Represent, and write vectors in component form. Perform basic vector operations and write vectors as linear combinations of unit vectors. Find the direction bearings of vectors.
Vectors and dot products	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Find the dot product of, and the angle between 2 vectors. Determine whether 2 vectors are orthogonal. Write vectors as sums of 2 vector components. Use vectors to find the work done by a force.
Trigonometric form of complex numbers	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Find the absolute values, and trigonometric forms of complex numbers. Multiply and divide complex numbers in trigonometric form. Use DeMoivre's theorem to find powers and the n-th roots of complex numbers.
Solving systems of equations	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Solve systems of equations by graphing and substitution.
Systems of linear equations in two variables	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Solve systems of equations by the elimination method. Graphically interpret the number of solutions in a system of equations.
Multivariable linear systems	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use Gaussian elimination and row-echelon form to solve systems of linear equations.
Systems of inequalities	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Sketch graphs of inequalities in 2 variables to solve systems of linear inequalities.
Linear programming	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Solve linear programming problems and use it to model and solve real-life problems.

Matrices and systems of equations	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Write matrices and identify their orders. Perform row operations and use Gaussian elimination to solve systems of linear equations.
Operations with matrices	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Add, subtract, multiply, and solve matrices.
The inverse of a square matrix	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Find and verify inverse matrices. Use inverse matrices to solve systems of linear equations.
The determinant of a square matrix	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Find the determinants of square matrices.
Applications of matrices and determinants	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use determinants to find the area of triangles. Use Cramer's Rule to solve systems of linear equations. Encode and decode messages.
Sequences and series	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use sequence notation to write the terms of sequences. Use factorial and summation notation. Find sums of series and infinite series.
Arithmetic sequences and partial sums	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Recognize, write and find the $n$ -th terms of arithmetic sequences. Find the $n$ -th partial sum of arithmetic sequences.
Geometric sequences and series	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Recognize, write and find the $n$ -th terms of geometric sequences. Find the infinite and $n$ -th partial sum of geometric sequences.
Mathematical induction	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use mathematical induction to prove statements involving a positive integer $n$ . Find sums of powers of integers, and finite differences of sequences.

The binomial theorem	3rd Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use the binomial theorem and Pascal's Triangle to calculate coefficients of binomial expansions.
Counting principles	4th Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Use the fundamental counting principle, permutations and combinations to solve counting problems.
Probability	4th Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Find probabilities of mutually exclusive, independent, dependent, and the complements of events.
Parabolas	4th Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Write equations of parabolas in standard form, and find the focus, vertex, and directrix.
Ellipses	4th Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Write equations of ellipses in standard form to find the foci, vertices, co-vertices and center.
Hyperbolas	4th Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Write equations of hyperbolas in standard form to find the center, foci, vertices and slant asymptotes.
Rotation and systems of quadratic equations	4th Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Rotate the coordinate to eliminate the $xy$ -term in equations of conics. Classify conics and solve systems of quadratic equations.
Parametric equations	4th Qtr.	PASS Standards A,B,C,D,E,F	Homework and Tests	Evaluate sets of parametric equations. Graph curves that are represented by sets of parametric equations. Rewrite sets of parametric equations as single rectangular equations by eliminating the parameter.

