

Helena Public Schools
High School Mathematics
Math IV / Pre-Calculus - Teacher Resource

Over-riding practices:

- *Students work with many topics covered previously in Math III, but at a more advanced level and approach (i.e. college-level)*
- *Many advanced applications of mathematical concepts*

Focal Points	
Algebra Topics	<ul style="list-style-type: none"> • Determine composition and inverses of functions (where the inverse exists) • Rational Functions-graph and identify discontinuities and limits • Factor and solve polynomial equations of various degrees, including those with complex roots-including polynomial long division and synthetic division • Logarithmic and Exponential Functions-graph, solve equations, applications such as time value of money, dB, and earthquakes • Conic Sections-define, graph, use completing the square to write equations in standard form
Trigonometry	<ul style="list-style-type: none"> • Unit Circle and special angle trigonometric values (0, 30, 45, 60 & 90 degrees) • Law of Cosines and Sines (including ambiguous case) with applications • Graphing trig. Functions • Modeling harmonic functions • Verifying and using trig. Identities • Solve trig. equations • Polar Coordinates-graph, convert between polar/rectangular coordinates, polar form of complex number • Vectors-resultant (geometric and algebraic), polar/rectangular form, applications
Matrices	<ul style="list-style-type: none"> • Calculate determinants and multiplicative inverses • Solving 2D and 3D systems including Reduced Row Echelon Form
Discrete Mathematics	<ul style="list-style-type: none"> • Arithmetic and Geometric Sequences and Series-recursive and explicit form equations, finding nth term • Sigma notation • Binomial Theorem
Maintenance Topics	
	<ul style="list-style-type: none"> • General transformations of functions • Graphing & solving inequalities • Basic matrix operations • Factoring • Fractional operations