

MCS Precalculus Subject Group Overview

Unit Name	Unit 1: Modeling with Rational and Piecewise-Defined Functions	Unit 2: Modeling with Trigonometric Expressions and Functions	Unit 3: Applying Trigonometric Identities and Equations	Unit 4: Modeling with Conic Sections and Polar Equations	Unit 5: Modeling with Vector Quantities	Unit 6: Modeling with Sequences and Series
Time Frame	4 -6 Weeks	5-6 Weeks	4-5 Weeks	4-5 Weeks	4-5 Weeks	4-5 Weeks
Standards	PC.FGR.2, PC.MM.1.1-4, PC.MP.1.1-8	PC.FGR.3, PC.MM.1.1-4, PC.MP.1.1-8	PC.AGR.4, PC.MM.1.1-4, PC.MP.1.1-8	PC.GSR.5, PC.MM.1.1-4, PC.MP.1.1-8	PC.AGR.6, PC.MM.1.1-4, PC.MP.1.1-8	PC.PAR.7, PC.MM.1.1-4, PC.MP.1.1-8
Content Specific Information	<ul style="list-style-type: none"> ● Model real-life problems with piecewise defined functions ● Identify characteristics of piecewise functions ● Determine if a limit exists ● Use one-sided limits to investigate continuity at a point ● Graph rational functions ● Identify characteristics of rational functions ● Solve simple rational equations in one variable ● Use both interval and inequality notation to report key characteristics 	<ul style="list-style-type: none"> ● Fluently convert between degree and radian measures. ● Develop the radian measure of the quadrantal angles ● Work with radian measures that are in terms of π and those not in terms of π. ● Connect the radian angle names on the 17-point unit circle to portions of 2π radians. ● Utilize the parametric interpretation of the coordinates on the unit circle as $(\cos(t), \sin(t))$ ● Develop the pythagorean identities ● Explore reciprocal and co-functional identities ● Determine the values of the six trigonometric functions for set conditions ● Restrict the domains of a trigonometric function to create inverse trigonometric functions ● Construct equations for contexts such as a Ferris Wheel ride, pendulum motion, tides, predator-prey models, sound waves, etc. 	<ul style="list-style-type: none"> ● Use the quotient, reciprocal, and Pythagorean identities. ● Investigate the connections between the identities as they are derived. ● Investigate the visual idea that solving $\sin(x) = \frac{1}{2}$ finds the graphical intersection of $y = \sin(x)$ and $y = \frac{1}{2}$. ● Investigate contexts such as a Ferris Wheel ride, pendulum motion, tides, predator-prey models, sound waves, etc. ● Solve trigonometric equations using algebraic techniques such as factoring, root methods, etc. ● Prove and apply (surveying problems, resultant forces, etc) the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles. ● Determine the area of an oblique triangle. 	<ul style="list-style-type: none"> ● Identify the graphs of conic sections given their equations in standard form. ● Convert from general to standard form of a conic equation and apply to contextual situations. ● Define polar coordinates and relate them to Cartesian coordinates ● Classify Special polar equations, like circles, cardioids, limaçons, and rose curves, and apply to contextual situations. ● Graph the trigonometric function in the Cartesian Plane using the corresponding polar function in the Polar Plane with and without technology 	<ul style="list-style-type: none"> ● Use appropriate and varied symbols for vectors and their magnitudes. ● Perform operations with vectors to find the resultant vector that solves a real-life problem. ● Understand, and explain tail-to-head, component-wise, and the parallelogram law of vector addition. ● Solve contextual vector problems, such as those involving velocity, force, and other quantities. ● Graph a pathway like $x(t)=3t$ and $y(t) = t^2 + 5$ that is traced from left to right as t increases and a pathway like $x(t)=-3t$ and $y(t) = t^2 + 5$ that is traced from right to left as t increases. ● Identify, represent, and graph circles, ellipses, and hyperbolas in parametric form. ● Explore situations like the position on a Ferris Wheel, movement along a curve in the Cartesian Plane, projectile motion, etc. 	<ul style="list-style-type: none"> ● Demonstrate that sequences are functions whose domain is the set of real numbers ● Fluently work with representations that are presented numerically, analytically or algebraically, symbolically, and graphically. ● Check for convergence or divergence with and without the use of technology. ● Use sigma notation. ● Explore the partial sums using technology ● Use limit notation to represent the convergence of the partial sums. ● Derive and use the sum formula of a finite geometric series to solve contextual problems to model real-life situations.

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	Common Assessments/ Performance Projects	Unit 1 Quiz, Skill checks, Warm-ups, Unit 1 Assessment	Unit 2 Quiz, Skills Checks, Unit 2 Assessment	Unit 3 Quiz, Skills Checks, Unit 3 Assessment	Unit 4 Quiz, Skills Checks, Unit 4 Assessment	Unit 5 Quiz, Skills Checks, Unit 5 Assessment	Unit 6 Quiz, Skills Checks, Unit 6 Assessment
	Differentiation For Tiered Learners	Marietta City Schools teachers provide specific differentiation of learning experiences for all students. Details for differentiation for learning experiences are included on the district unit planners.					