

## MATHEMATICS CORE CURRICULUM ESSENTIAL CONCEPTS

	<b>ALGEBRA</b>	<b>GEOMETRY</b>	<b>INTERMEDIATE ALGEBRA</b>	<b>PRECALCULUS</b>
<b>SEPTEMBER</b>	Compare and plot rational numbers Simplify numeric rational expressions Perfect squares and square roots Classify numbers as rational or irrational Relate properties and operations to rational and irrational numbers Write Algebra expressions	Predict and extend design Draw conjectures Write conditional, converse and inverse statements Determine truth value Write counter examples Write good definitions, Use appropriate representation Parallel, perpendicular and skew lines and perpendicular bisectors Midpoint Prove lines parallel or perpendicular Review slope-intercept form Write the equation of a line perpendicular or parallel to a second	Review solving systems of 2x2 equations (at least 4 ways) Review solving absolute value and inequality equations Compare & contrast relations and functions	Systems of Equations Domain & Range of functions Exponential functions*  <i>For each * general topic include all of the following material: graph &amp; include all important points, find the regression equation, domain, range, perform transformations on the graph, predict other values, find real-world applications, explore composite functions in this area, explore rates of change.</i>
<b>OCTOBER</b>	Write multi-step equations Solve multi-step equations Write inequalities to represent situations Solve multi-step one variable inequalities Write equations to represent linear relationships	Measure angles, review classifications Adjacent, complementary, supplementary, linear or vertical angle pairs Classify angle pairs formed by parallel lines cut by a transversal. Prove lines parallel through angle relationships Construct, copy and bisect angles Solve for unknown angle using sum of angles in a triangle Identify and construct a median, angle bisector, and altitude	Matrix operations using pencil/paper & technology Identify additive & multiplicative inverses Solve system of equations (3x3) Simplify radical expressions including imaginary numbers	Explore Power functions* Explore Polynomial functions*
<b>NOVEMBER</b>	Solve problems involving constant rates of change Review slope as a rate of change Identify the slope of a line Identify horizontal and vertical lines given equations Determine and explain the meaning of intercepts	Review and discover congruency in triangles Formulate rules for proving congruency Prove congruency Review proportional reasoning and indirect measure Review solving for a missing side of similar triangles Discover conditions that make triangles similar Prove similarity of triangles	Explore square root functions (graph, domain & range) Explore the basic properties of a quadratic function Introduce all types of transformations (translate, dilate, reflect)	(continue) Polynomial functions* Explore Logarithmic functions*
<b>DECEMBER</b>	Represent equations in slope-intercept form Graph linear functions Represent linear equations in standard form Determine X and Y intercepts Graph linear functions using intercepts	Apply Pythagorean Theorem Develop the distance formula Apply distance formula to prove diagonals of a rectangle are congruent Special right triangles (30-60-90 and 45-45-90 triangles) Solve problems using the properties of special right triangles Using altitude to the hypotenuse of a right triangle and the geometric mean, find missing measures of right triangles	Explore parabolas (writing equations, transformations, and finding the critical points) Explore circles (equations, complete the square)	(continue) Logarithmic functions* Explore Rational functions*
<b>JANUARY</b>	Identify the domain and range. Write the equation of a line given graph, slope and point, and ordered pairs. Distinguish between linear and non-linear functions Solve linear formulas and literal equations.	Use similar right triangles to solve problems of indirect measurement Identify adjacent, opposite and hypotenuse given any acute angle in a right triangle Write ratios for these sides Write trigonometric ratios Find the angle measurement in degrees given a trigonometric ratio Find the trigonometric ratio given the angle. Solve real world problems using trig ratios Law of sines and cosines	Explore the Quadratic Formula Fit a quadratic equation to data and then determine: min, max, slope, & predictions in the context of the problem Explore quadratic inequalities	Explore Trigonometric functions*
<b>FEBRUARY</b>	Explore how changing the value of m and b effects the graphs of linear relations Determine whether two lines are parallel, perpendicular or neither given the equations Graph linear inequalities and identify the boundary line and solution area Collect, record, organize and display various sets of linear and non-linear data. Determine if the pattern of the data is linear or nonlinear	Review and verify classification of quadrilaterals Review and use distance, slope and midpoint formulas Verify congruency of diagonals in a rectangle Find the area of quadrilaterals Solve problems for regular polygons and irregular regions Discover the effect on area changing linear dimensions Determine relationship between measure of angles, number of sides Find the sum and measures of interior and exterior angles	Convert between exponential & radical equations Solve radical equations & check Practice rational expression manipulations (+, -, LCM)	Explore Inverse Trig functions Explore Vectors Explore Parametric Equations
<b>MARCH</b>	Interpret the correlation between two variables as being positive, negative or having no correlation Find the line of best fit, explore meaning of slope and intercept and make predictions using the line of best fit Find midpoint Find the distance between two points Solve problems using Pythagorean Theorem Solve problems using the distance formula Simplify irrational numeric expression	Analyze and perform transformations Identify parts of circle, tangents of a circle) Introduce circle on a coordinate system given the equation in the form $(x-h)^2 + (y-k)^2 = r^2$ Define pi and calculate area of circle given the formula Explore area differences Identify geometric probabilities Calculate geometric probability Find the area of a sector Arc length Intercepted arc, inscribed angle, and a central angle	Solve rational expressions Explore composite and inverse functions Introduce combinations & permutations Convert from radian to degree	Explore Polar Coordinates Explore Rectangular Form
<b>APRIL</b>	Find missing parts of geometric figures using proportional reasoning and geometric relationships Solve systems of two linear equations Solve systems of two inequalities Illustrate multiplication of polynomials using area models Use area models to factor polynomials	Classify 3-D objects according Use nets to build shapes Use a table to derive Euler's Formula Calculate surface area and volume of 3-D objects Discover the effect on volume when changes are made in the linear dimensions of the shape Sketch the cross sections of solids	Find arc lengths & sectors of circles Review 6 trig functions Find exact values of trig functions using the unit circle Perform transformations on trig functions (amplitude, period, phase shift, reflections)	Systems of Non-linear equations Explore Series & Sequence Explore Probability sample spaces, and/or independent events
<b>MAY</b>	Determine if a game or process is fair Determine and express the probability of an event Identify the probability of an event as being between 0 and 1 Recognize the sum of probability of an event and its complement is equal to 1. Use multiples of pi Review for CRT	Real world projects applying geometric knowledge Review for CRT	Review for CRT after the CRT in anticipation of Pre-Calculus, explore logarithms and sequence & series.	(continue) Probability Conditional Probability Expected Values Binomial Theorem