

# Mansfield ISD Grade 8 through Pre-Calculus

## Scope and Sequence

Grade 8 TEKS	Algebra I	Geometry	Math Models	Algebra II	Pre-calculus
(8.1A) <u>Number, Operation and Quantitative Reasoning</u> compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals					
(8.1B) <u>Number, Operation and Quantitative Reasoning</u> select and use appropriate forms of rational numbers to solve real-life problems including those involving proportional relationships					
(8.1C) <u>Number, Operation and Quantitative Reasoning</u> approximate (mentally and with calculators) the value of irrational numbers as they arise from problem situations (such as $\pi$ , $\sqrt{2}$ )					
	A.11A <u>Quadratic and other Nonlinear Structures</u> use patterns to generate the laws of exponents and apply them in problem-solving situations				
(8.1D) <u>Number, Operation and Quantitative Reasoning</u> express numbers in scientific notation, including negative exponents, in appropriate problem situations					
(8.1E) <u>Number, Operation and Quantitative Reasoning</u> compare and order real numbers with a calculator					
(8.2A) <u>Number, Operation and Quantitative Reasoning</u> select appropriate operations to solve					

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problems involving rational numbers and justify the selections					
(8.2B) <b>Number, Operation and Quantitative Reasoning</b> use appropriate operations to solve problems involving rational numbers in problem situations	<p>A.4A <b>Foundations for Functions</b> find specific function values, simplify polynomial expressions, transform and solve equations, and factor as necessary in problem situations</p> <p>A.4B <b>Foundations for Functions</b> use the commutative, associative and distributive properties to simplify algebraic expressions</p>			<p>2A.2A use tools including factoring and properties of exponents to simplify expressions and to transform and solve equations</p> <p>2A.2B use complex numbers to describe the solutions of quadratic equations</p> <p>2A5E use the method of completing the square</p>	
(8.2C) <b>Number, Operation and Quantitative Reasoning</b> evaluate a solution for reasonableness	<p>A.2B <b>Foundations for Functions</b> identify mathematical domains and ranges and determine reasonable domains and range values for given situations, both continuous and discrete</p> <p>A5B <b>Linear Functions</b> determine the domain and range for linear functions in given situations</p> <p>A7C <b>Linear Functions</b> interpret and determine the reasonableness of solutions to linear equations and inequalities</p> <p>A.8C <b>Linear Functions</b> interpret and determine the reasonableness of solutions to systems of linear equations</p>			<p>2A.1A identify the mathematical domains and ranges of functions and determine reasonable domains and range values for continuous and discrete situations</p> <p>2A.3C interpret and determine the reasonableness of solutions to systems of equations or inequalities for given contexts</p> <p>2A6A determine the reasonable domain and range values of quadratic functions, as well as interpret and determine the reasonableness of solutions to quadratic equations and inequalities</p> <p>2A9C determine the reasonable domain and range values of square root functions, as well as interpret and determine the reasonableness of solutions to square root equations and inequalities</p>	P.1B determine the domain and range of functions using graphs, tables, and symbols

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				<p>2A.10C determine the reasonable domain and range values of rational functions, as well as interpret and determine the reasonableness of solutions to rational equations and inequalities</p> <p>2A.11C determine the reasonable domain and range values of exponential and logarithmic functions, as well as interpret and determine the reasonableness of solutions to exponential and logarithmic equations and inequalities</p>	
(8.2D) <u>Number, Operation and Quantitative Reasoning</u> use multiplication by a constant factor (unit rate) to represent proportional relationships		<p><u>6.8B Congruence and the Geometry of Size</u> find areas of sectors and arc lengths of circles using proportional reasoning</p> <p><u>6.8F Congruence and the Geometry of Size</u> use conversions between measurement systems to solve problems in real-world situations</p>			
(8.3B) <u>Patterns, Relationships, and Algebraic Thinking</u> estimate and find solutions to application problems involving percent and other proportional relationships such as similarity and rate					
(8.3A) <u>Patterns, Relationships, and Algebraic Thinking</u> compare and contrast proportional and non-proportional linear relationships	<p>A.2A <u>Foundations for Functions</u> identify and sketch the general forms of linear (<math>y = x</math>) and quadratic (<math>y = x^2</math>) parent functions</p> <p>A.5A <u>Linear Functions</u> determine whether or not given situations can be represented by linear functions</p> <p>A.6A <u>Linear Functions</u> develop</p>	<p><u>6.7B Dimensionality and the Geometry of Location</u> use slopes and equations of lines to investigate geometric relationships, including parallel lines, perpendicular lines, and special segments of triangles and other polygons</p> <p><u>6.9A Congruence and the Geometry of Size</u> formulate and test conjectures about the properties of parallel and</p>	<p>M.2D use regression methods available through technology to describe various models for data such as linear, quadratic, exponential, etc., select the most appropriate model, and use the model to interpret information</p> <p>M.3C determine the appropriateness of a model for making predictions from a given set of data</p>	<p>2A.4A identify and sketch graphs of parent functions, including linear (<math>f(x) = x</math>), quadratic (<math>f(x) = x^2</math>), exponential (<math>f(x) = a^x</math>), and logarithmic (<math>f(x) = \log_a x</math>) functions, absolute value of <math>x</math> (<math>f(x) =  x </math>), square root of <math>x</math> (<math>f(x) = \sqrt{x}</math>), and reciprocal of <math>x</math> (<math>f(x) = 1/x</math>);</p> <p>2A.4B extend parent functions with parameters such as <math>a</math> in <math>f</math></p>	<p>P.1A describe parent functions symbolically and graphically, including <math>f(x) = xn</math>, <math>f(x) = \ln x</math>, <math>f(x) = \log_a x</math>, <math>f(x) = 1/x</math>, <math>f(x) = ex</math>, <math>f(x) =  x </math>, <math>f(x) = ax</math>, <math>f(x) = \sin x</math>, <math>f(x) = \arcsin x</math>, etc</p> <p>P.2A apply basic transformations, including <math>a \cdot f(x)</math>, <math>f(x) + d</math>, <math>f(x - c)</math>, <math>f(b \cdot x)</math>, and compositions with absolute value functions, including <math> f(x) </math>, and <math>f( x )</math>, to the parent functions</p>

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	<p>the concept of slope as rate of change and determine slopes from graphs, tables, and algebraic representations</p> <p><b>A.6B Linear Functions</b> interpret the meaning of slope and intercepts in situations using data, symbolic representations, or graphs</p> <p><b>A.6C Linear Functions</b> investigate, describe, and predict the effects of changes in <math>m</math> and <math>b</math> on the graph of <math>y = mx + b</math></p> <p><b>A.6D Linear Functions</b> graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and <math>y</math>-intercept</p>	<p>perpendicular lines based on explorations and concrete models</p>	<p><b>M.5A</b> use rates, linear functions, and direct variation to solve problems involving personal finance and budgeting, including compensations and deductions</p> <p><b>M.8A</b> use geometric models available through technology to model growth and decay in areas such as population, biology, and ecology</p> <p><b>M.8C</b> use direct and inverse variation to describe physical laws such as Hook's, Newton's, and Boyle's laws</p>	<p><math>(x) = a/x</math> and describe the effects of the parameter changes on the graph of parent functions</p> <p><b>2A.5B</b> sketch graphs of conic sections to relate simple parameter changes in the equation to corresponding changes in the graph</p> <p><b>2A.5D</b> identify the conic section from a given equation;</p>	<p><b>P.3A</b> investigate properties of trigonometric and polynomial functions</p> <p><b>P.3C</b> use regression to determine the appropriateness of a linear function to model real-life data (including using technology to determine the correlation coefficient);</p>
	<p><b>A.6E Linear Functions</b> determine the intercepts of the graphs of linear functions and zeros of linear functions from graphs, tables, and algebraic representations</p> <p><b>A.6F Linear Functions</b> interpret and predict the effects of changing slope and <math>y</math>-intercept in applied situations</p> <p><b>A.6G Linear Functions</b> relate direct variation to linear functions and solve problems involving proportional change</p> <p><b>A.9A Quadratic and other Nonlinear Structures</b> determine the domain and range for quadratic functions in given</p>			<p><b>2A.7B</b> use the parent function to investigate, describe, and predict the effects of changes in <math>a</math>, <math>h</math>, and <math>k</math> on the graphs of <math>y = a(x - h)^2 + k</math> form of a function in applied and purely mathematical situations</p> <p><b>2A.9A</b> use the parent function to investigate, describe, and predict the effects of parameter changes on the graphs of square root functions and describe limitations on the domains and ranges</p> <p><b>2A.10A</b> use quotients of polynomials to describe the graphs of rational functions, predict the effects of parameter changes, describe limitations on the domains and ranges, and examine asymptotic</p>	

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	<p>situations</p> <p><b>A.9B Quadratic and other Nonlinear Structures</b> investigate, describe, and predict the effects of changes in <math>a</math> on the graph of <math>y = ax^2 + c</math></p> <p><b>A.9C Quadratic and other Nonlinear Structures</b> investigate, describe, and predict the effects of changes in <math>c</math> on the graph of <math>y = ax^2 + c</math></p> <p><b>A.9D Quadratic and other Nonlinear Structures</b> analyze graphs of quadratic functions and draw conclusions</p>			<p>behavior</p> <p>2A.11B use the parent functions to investigate, describe, and predict the effects of parameter changes on the graphs of exponential and logarithmic functions, describe limitations on the domains and ranges, and examine asymptotic behavior</p>	
<p><b>(8.4A) Patterns, Relationships, and Algebraic Thinking</b> generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description)</p>	<p><b>A.1A Foundations for Functions</b> describe independent and dependent quantities in functional relationships</p> <p><b>A.1B Foundations for Functions</b> gather and record data and use data sets to determine functional relationships between quantities</p> <p><b>A.1C Foundations for Functions</b> describe functional relationships for given problem situations and write equations or inequalities to answer questions arising from the situations</p> <p><b>A.1D Foundations for Functions</b> represent relationships among quantities using concrete models, tables, graphs, diagrams, verbal descriptions, equations, and</p>	<p><b>G.4 Geometric Structure</b> describe geometric relationships and solve problems. The student is expected to select an appropriate representation (concrete, pictorial, graphical, verbal, or symbolic) in order to solve problems</p>		<p>2A.6B relate representations of quadratic functions, such as algebraic, tabular, graphical, and verbal descriptions</p> <p>2A.7A use characteristics of the quadratic parent function to sketch the related graphs and connect between the <math>y = ax^2 + bx + c</math> and the <math>y = a(x - h)^2 + k</math> symbolic representations of quadratic functions</p> <p>2A.8C compare and translate between algebraic and graphical solutions of quadratic equations</p> <p>2A.9B relate representations of square root functions, such as algebraic, tabular, graphical, and verbal descriptions</p> <p>2A.10B analyze various representations of rational</p>	<p>P.1D recognize and use connections among significant values of a function (zeros, maximum values, minimum values, etc.), points on the graph of a function, and the symbolic representation of a function</p> <p>P.1E investigate the concepts of continuity, end behavior, asymptotes, and limits and connect these characteristics to functions represented graphically and numerically</p> <p>P.5C convert between parametric and rectangular forms of functions and equations to graph them;</p>

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	<p>inequalities</p> <p>A.5C <u>Linear Functions</u> use, translate, and make connections among algebraic, tabular, graphical, or verbal descriptions of linear functions</p> <p>A.10B <u>Quadratic and other Nonlinear Structures</u> make connections among the solutions (roots) of quadratic equations, the zeros of their related functions, and the horizontal intercepts (x-intercepts) of the graph of the function</p>			<p>functions with respect to problem situations</p>	
<p>(8.5B) <u>Patterns, Relationships, and Algebraic Thinking</u> find and evaluate an algebraic expression to determine any term in an arithmetic sequence (with a constant rate of change).</p>	<p>A.3A <u>Foundations for Functions</u> use symbols to represent unknowns and variables</p> <p>A.3B <u>Foundations for Functions</u> look for patterns and represent generalizations algebraically</p> <p>A.4C <u>Foundations for Functions</u> connect equation notation with function notation, such as <math>y = x + 1</math> and <math>f(x) = x + 1</math></p>	<p>G.5A <u>Geometric Patterns</u> use numeric and geometric patterns to develop algebraic expressions representing geometric properties</p>			<p>P.4A represent patterns using arithmetic and geometric sequences and series</p> <p>P.4B use arithmetic, geometric, and other sequences and series to solve real-life problems</p>
<p>(8.5A) <u>Patterns, Relationships, and Algebraic Thinking</u> predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations</p>	<p>A.1E <u>Foundations for Functions</u> interpret and make decisions, predictions, and critical judgments from functional relationships</p> <p>A.2C <u>Foundations for Functions</u> interpret situations in terms of</p>			<p>2A.3B use algebraic methods, graphs, tables, or matrices, to solve systems of equations or inequalities</p> <p>2A.8B analyze and interpret the solutions of quadratic equations</p>	<p>P.6B analyze and solve vector problems generated by real-life situations</p>

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	<p>given graphs or creates situations that fit given graphs</p> <p><b>A.7B <u>Linear Functions</u></b> investigate methods for solving linear equations and inequalities using concrete models, graphs, and the properties of equality, select a method, and solve the equations and inequalities</p> <p><b>A.8B <u>Linear Functions</u></b> solve systems of linear equations using concrete models, graphs, tables, and algebraic methods</p> <p><b>A.10A <u>Quadratic and other Nonlinear Structures</u></b> solve quadratic equations using concrete models, tables, graphs, and algebraic methods</p>			<p>using discriminants and solve quadratic equations using the quadratic formula</p> <p>2A.8D solve quadratic equations and inequalities using graphs, tables, and algebraic method</p> <p>2A.9D determine solutions of square root equations using graphs, tables, and algebraic methods</p> <p>2A.9E determine solutions of square root inequalities using graphs and tables</p> <p>2A.10D determine the solutions of rational equations using graphs, tables, and algebraic methods</p> <p>2A.10E determine solutions of rational inequalities using graphs and tables</p> <p>2A.11D determine solutions of exponential and logarithmic equations using graphs, tables, and algebraic methods</p> <p>2A.11E determine solutions of exponential and logarithmic inequalities using graphs and table</p>	
	<p><b>A.7A <u>Linear Functions</u></b> analyze situations involving linear functions and formulate linear equations or inequalities to solve problems</p> <p>A.8A analyze situations and</p>	<p><b>6.7C <u>Dimensionality and the Geometry of Location</u></b> derive and use formulas involving length, slope, and midpoint</p>	<p>M.9B use geometric transformations, proportions, and periodic motion to describe mathematical patterns and structure in music</p>	<p>2A.3A analyze situations and formulate systems of equations in two or more unknowns or inequalities in two unknowns to solve problems</p> <p>2A.6C determine a quadratic function from its roots (real and complex) or a graph</p>	<p>P.3B use functions such as logarithmic, exponential, trigonometric, polynomial, etc. to model real-life data</p> <p>P.3D use properties of functions to analyze and solve problems and make predictions</p>

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	<p>formulate systems of linear equations in two unknowns to solve problems</p> <p><b>A.11B Quadratic and other Nonlinear Structures</b> analyze data and represent situations involving inverse variation using concrete models, tables, graphs, or algebraic methods</p> <p><b>A.11C Quadratic and other Nonlinear Structures</b> analyze data and represent situations involving exponential growth and decay using concrete models, tables, graphs, or algebraic methods</p>			<p>2A.8A analyze situations involving quadratic functions and formulate quadratic equations or inequalities to solve problems</p> <p>2A.9F analyze situations modeled by square root functions, formulate equations or inequalities, select a method, and solve problems</p> <p>2A.10F analyze a situation modeled by a rational function, formulate an equation or inequality composed of a linear or quadratic function, and solve the problem</p> <p>2A.10G use functions to model and make predictions in problem situations involving direct and inverse variation</p> <p>2A.11F analyze a situation modeled by an exponential function, formulate an equation or inequality, and solve the problem</p>	<p>P.5A use conic sections to model motion, such as the graph of velocity vs. position of a pendulum and motions of planets</p> <p>P.5B use properties of conic sections to describe physical phenomena such as the reflective properties of light and sound</p> <p>P.5D use parametric functions to simulate problems involving motion</p> <p>P.6A use the concept of vectors to model situations defined by magnitude and direction</p>
		<p><b>6.9B Congruence and the Geometry of Size</b> formulate and test conjectures about the properties and attributes of polygons and their component parts based on explorations and concrete models</p>			
		<p><b>6.2B Geometric Structure</b> make conjectures about angles, lines, polygons, circles, and three-dimensional figures and</p>			

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		<p>determine the validity of the conjectures, choosing from a variety of approaches such as coordinate, transformational, or axiomatic</p> <p><b>6.9D Congruence and the Geometry of Size</b> analyze the characteristics of polyhedra and other three-dimensional figures and their component parts based on explorations and concrete models</p>			
(8.6A) <b>Geometry and Spatial Reasoning</b> generate similar figures using dilations including enlargements and reductions		<p><b>6.2A Geometric Structure</b> use constructions to explore attributes of geometric figures and to make conjectures about geometric relationships</p> <p><b>6.11A Similarity and the Geometry of Shape</b> use and extend similarity properties and transformations to explore and justify conjectures about geometric figures</p> <p><b>6.11B Similarity and the Geometry of Shape</b> use ratios to solve problems involving similar figures</p> <p><b>6.11C Similarity and the Geometry of Shape</b> develop, apply, and justify triangle similarity relationships, such as right triangle ratios, trigonometric ratios, and Pythagorean triples using a variety of methods</p>			
(8.7D) <b>Geometry and Spatial Reasoning</b> locate and name points on a coordinate plane using ordered pairs of rational numbers		<p><b>6.7A Dimensionality and the Geometry of Location</b> use one- and two-dimensional coordinate systems to represent points, lines, rays, line segments, and figures</p>			

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8.6B <b>Geometry and Spatial Reasoning</b> graph dilations, reflections, and translations on a coordinate plane		<p>G.5C <b>Geometric Patterns</b> use properties of transformations and their compositions to make connections between mathematics and the real world, such as tessellations</p> <p>G.10A <b>Congruence and the Geometry of Size</b> use congruence transformations to make conjectures and justify properties of geometric figures including figures represented on a coordinate plane</p>		2A.5C identify symmetries from graphs of conic sections	P.1C describe symmetry of graphs of even and odd functions
8.7A <b>Geometry and Spatial Reasoning</b> draw three-dimensional figures from different perspective		<p>G.6A <b>Dimensionality and the Geometry of Location</b> describe and draw the intersection of a given plane with various three-dimensional geometric figures</p> <p>G.6C <b>Dimensionality and the Geometry of Location</b> use orthographic and isometric views of three-dimensional geometric figures to represent and construct three-dimensional geometric figures and solve problems</p>		2A.5A describe a conic section as the intersection of a plane and a cone	
8.7C <b>Geometry and Spatial Reasoning</b> use pictures or models to demonstrate the Pythagorean Theorem					
8.7B <b>Geometry and Spatial Reasoning</b> use geometric concepts and properties to solve problems in fields such as art and architecture			M.9A use geometric transformations, symmetry, and perspective drawings to describe mathematical patterns and structure in art and architecture		
		G.8A <b>Congruence and the</b>			

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		<u>Geometry of Size</u> find areas of regular polygons, circles, and composite figures			
8.8A <b>Measurement</b> estimate measurements and use formulas to solve application problems involving lateral and total surface area and volume		<u>G.6B Dimensionality and the Geometry of Location</u> use nets to represent and construct three-dimensional geometric figures			
8.8B <b>Measurement</b> connect models of prisms, cylinders, pyramids, spheres, and cones to formulas for volume of these objects		<u>G.8D Congruence and the Geometry of Size</u> find surface areas and volumes of prisms, pyramids, spheres, cones, cylinders, and composites of these figures in problem situations			
8.8C <b>Measurement</b> estimate measurements and use formulas to solve application problems involving lateral and total surface area and volume					
8.9A <b>Measurement</b> use the Pythagorean Theorem to solve real-life problems		<u>G.5D Geometric Patterns</u> identify and apply patterns from right triangles to solve meaningful problems, including special right triangles (45-45-90 and 30-60-90) and triangles whose sides are Pythagorean triples  <u>G.8C Congruence and the Geometry of Size</u> derive, extend, and use the Pythagorean Theorem	M.8B use trigonometric ratios and functions available through technology to calculate distances and model periodic motion		
8.9B <b>Measurement</b> use proportional relationships in		<u>G.10B Congruence and the Geometry of Size</u> justify and			

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similar two-dimensional figures or similar three-dimensional figures to find missing measurements		apply triangle congruence relationships			
8.10A <b>Measurement</b> describe the resulting effects on perimeter and area when dimensions of a shape are changed proportionally		6.11D <b>Similarity and the Geometry of Shape</b> describe the effect on perimeter, area, and volume when one or more dimensions of a figure are changed and apply this idea in solving problems			
8.10B <b>Measurement</b> describe the resulting effect on volume when dimensions of a solid are changed proportionally					
8.11A <b>Probability and Statistics</b> find the probabilities of dependent and independent events					
8.11B <b>Probability and Statistics</b> use theoretical probabilities and experimental results to make predictions and decisions			M.4A compare theoretical and empirical probability  M.4B use experiments to determine the reasonableness of a theoretical model such as binomial, geometric		
8.11C <b>Probability and Statistics</b> select and use different models to simulate an event		6.8E <b>Congruence and the Geometry of Size</b> use area models to connect geometry to probability and statistics			
8.12C <b>Probability and Statistics</b> select and use an appropriate representation for presenting and displaying relationships among collected data, including line plots, line graphs, stem and leaf plots, circle graphs, bar graphs, box and whisker plots, histograms, and Venn diagrams, with and without the use of technology			M.2A interpret information from various graphs, including line graphs, bar graphs, circle graphs, histograms, scatterplots, line plots, stem and leaf plots, and box and whisker plots to draw conclusions from the data  M.2C analyze graphs from journals, newspapers, and other sources to determine the validity of stated arguments		
8.12B <b>Probability and Statistics</b> draw conclusions and make predictions by analyzing trends	A.2D <b>Foundations for Functions</b> collect and organize data, make and interpret scatterplots			2A.1B collect and organize data, make and interpret scatterplots, fit the graph of a function to the	

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in scatterplots	(including recognizing positive, negative, or no correlation for data approximating linear situations), and model, predict, and make decisions and critical judgments in problem situations			data, interpret the results, and proceed to model, predict, and make decisions and critical judgments	
8.12A <u>Probability and Statistics</u> select the appropriate measure of central tendency or range to describe a set of data and justify the choice for a particular situation			M.2B analyze numerical data using measures of central tendency, variability, and correlation in order to make inferences		
8.13A <u>Probability and Statistics</u> evaluate methods of sampling to determine validity of an inference made from a set of data			M.3A formulate a meaningful question, determine the data needed to answer the question, gather the appropriate data, analyze the data, and draw reasonable conclusions		
8.13B <u>Probability and Statistics</u> recognize misuses of graphical or numerical information and evaluate predictions and conclusions based on data analysis					
8.14A <u>Underlying Processes and Mathematical Tools</u> identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics		<u>G.1B Geometric Structure</u> recognize the historical development of geometric systems and know mathematics is developed for a variety of purposes	M.5B solve problems involving personal taxes  M.5C analyze data to make decisions about banking  M.6A analyze methods of payment available in retail purchasing and compare relative advantages and disadvantages of each option  M.6B use amortization models to investigate home financing and compare buying and renting a home  M.6C use amortization models to		

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			<p>investigate automobile financing and compare buying and leasing a vehicle</p> <p>M.7A analyze types of savings options involving simple and compound interest and compare relative advantages of these options</p> <p>M.7B analyze and compare coverage options and rates in insurance</p> <p>M.7C investigate and compare investment options including stocks, bonds, annuities, and retirement plans</p>		
8.14B <u>Underlying Processes and Mathematical Tools</u> use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan			M.1C select a method to solve a problem, defend the method, and justify the reasonableness of the results		
8.14C <u>Underlying Processes and Mathematical Tools</u> select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem			<p>M.1A compare and analyze various methods for solving a real-life problem</p> <p>M.1B use multiple approaches (algebraic, graphical, and geometric methods) to solve problems from a variety of disciplines</p>		
8.14D <u>Underlying Processes and Mathematical Tools</u> select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems					
8.15A <u>Underlying Processes and Mathematical Tools</u>		G.1A <u>Geometric Structure</u> develop an awareness of the	M.3B communicate methods used, analyses conducted, and		

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communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models		structure of a mathematical system, connecting definitions, postulates, logical reasoning, and theorems  <u>6.1C Geometric Structure</u> compare and contrast the structures and implications of Euclidean and non-Euclidean geometries	conclusions drawn for a data-analysis project by written report, visual display, oral report, or multi-media presentation		
<u>8.15B Underlying Processes and Mathematical Tools</u> evaluate the effectiveness of different representations to communicate ideas					
<u>8.16A Underlying Processes and Mathematical Tools</u> make conjectures from patterns or sets of examples and non-examples		<u>6.3A Geometric Structure</u> determine the validity of a conditional statement, its converse, inverse, and contrapositive			
<u>8.16B Underlying Processes and Mathematical Tools</u> validate his/her conclusions using mathematical properties and relationships		<u>6.3B Geometric Structure</u> construct and justify statements about geometric figures and their properties  <u>6.3C Geometric Structure</u> use logical reasoning to prove statements are true and find counter examples to disprove statements that are false  <u>6.3D Geometric Structure</u> use inductive reasoning to formulate a conjecture  <u>6.3E Geometric Structure</u> use deductive reasoning to prove a statement  <u>6.5B Geometric Patterns</u> use numeric and geometric patterns to make generalizations about			

# Mansfield ISD Grade 8 through Pre-Calculus

## Scope and Sequence

Grade 8 TEKS	Algebra I	Geometry	Math Models	Algebra II	Pre-calculus
		geometric properties, including properties of polygons, ratios in similar figures and solids, and angle relationships in polygons and circles  <b>6.9C Congruence and the Geometry of Size</b> formulate and test conjectures about the properties and attributes of circles and the lines that intersect them based on explorations and concrete models			
				2A.4C describe and analyze the relationship between a function and its inverse  2A.9G connect inverses of square root functions with quadratic functions  2A.11A develop the definition of logarithms by exploring and describing the relationship between exponential functions and their inverses	P.2B perform operations including composition on functions, find inverses, and describe these procedures and results verbally, numerically, symbolically, and graphically;
					P.2C investigate identities graphically and verify them symbolically, including logarithmic properties, trigonometric identities, and exponential properties
					P.3E solve problems from physical situations using trigonometry, including the use of Law of Sines, Law of Cosines, and area formulas and incorporate radian measure where needed
					P.4C describe limits of sequences and apply their properties to investigate convergent and divergent series
					P.4D apply sequences and series to solve problems including sums and binomial expansion

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## Scope and Sequence