

PISD Vertical Alignment
of Student Expectations
Mathematics Grades 6-12

6th Grade	7th Grade	8th Grade	Algebra	Geometry	Math Models	Algebra II	Precalculus
6.1A compare and order non-negative rational numbers	7.1A compare and order integers and positive rational numbers	8.1A compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals					
6.1B generate equivalent forms of rational numbers including whole numbers, fractions, and decimals	7.1B convert between fractions, decimals, whole numbers, and percents mentally, on paper, or with a calculator	8.1B select and use appropriate forms of rational numbers to solve real-life problems including those involving proportional relationships					
	7.1C represent squares and square roots using geometric models	8.1C approximate (mentally and with calculators) the value of irrational numbers as they arise from problem situations (such as π , $\sqrt{2}$);					
6.1C use integers to represent real-life situations							
6.1D write prime factorizations using exponents			A.11A use patterns to generate the laws of exponents and apply them in problem-solving situations				
		8.1D express numbers in scientific notation, including negative exponents, in appropriate problem situations					
		8.1E compare and order real numbers with a calculator					
6.1E identify factors of a positive integer, common factors, and the greatest common factor of a set of positive integers							
6.1F identify multiples of a positive integer and common multiples and the least common multiple of a set of positive integers							

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6.2A model addition and subtraction situations involving fractions with objects, pictures, words, and numbers	7.2A represent multiplication and division situations involving fractions and decimals with models, including concrete objects, pictures, words, and numbers						
		8.2A select appropriate operations to solve problems involving rational numbers and justify the selections					
6.2B use addition and subtraction to solve problems involving fractions and decimals	7.2B use addition, subtraction, multiplication, and division to solve problems involving fractions and decimals	8.2B use appropriate operations to solve problems involving rational numbers in problem situations	A.4A find specific function values, simplify polynomial expressions, transform and solve equations, and factor as necessary in problem situations A.4B use the commutative, associative, and distributive properties to simplify algebraic expressions			2A.2A use tools including factoring and properties of exponents to simplify expressions and to transform and solve equations 2A.2B use complex numbers to describe the solutions of quadratic equations 2A.5E use the method of completing the square	
6.2C use multiplication and division of whole numbers to solve problems including situations involving equivalent ratios and rates							
	7.2C use models, such as concrete objects, pictorial models, and number lines, to add, subtract, multiply, and divide integers and connect the actions to algorithms						

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6th Grade	7th Grade	8th Grade	Algebra	Geometry	Math Models	Algebra II	Precalculus
6.2D estimate and round to approximate reasonable results and to solve problems where exact answers are not required	7.2G determine the reasonableness of a solution to a problem	8.2C evaluate a solution for reasonableness	<p>A.2B identify mathematical domains and ranges and determine reasonable domain and range values for given situations, both continuous and discrete</p> <p>A.5B determine the domain and range for linear functions in given situations</p> <p>A.7C interpret and determine the reasonableness of solutions to linear equations and inequalities</p> <p>A.8C 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 domain 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>2A.6A 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>2A.9C 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>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</p>	P.1B determine the domain and range of functions using graphs, tables, and symbols
	7.2D use division to find unit rates and ratios in proportional relationships such as speed, density, price, recipes, and student-teacher ratio	8.2D use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems		<p>G.8B find areas of sectors and arc lengths of circles using proportional reasoning</p> <p>G.8F use conversions between measurement systems to solve problems in real-world situations</p>			
6.2E use order of operations to simplify whole number expressions (without exponents) in problem solving situations	7.2E simplify numerical expressions involving order of operations and exponents						

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	7.2F select and use appropriate operations to solve problems and justify the selections						
6.3A use ratios to describe proportional situations							
6.3B represent ratios and percents with concrete models, fractions, and decimals	7.3A estimate and find solutions to application problems involving percent	8.3B estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates					
6.3C use ratios to make predictions in proportional situations	7.3B estimate and find solutions to application problems involving proportional relationships such as similarity, scaling, unit costs, and related measurement units	8.3A compare and contrast proportional and non-proportional linear relationships	A.2A identify and sketch the general forms of linear ($y = x$) and quadratic ($y = x^2$) parent functions A.5A determine whether or not given situations can be represented by linear functions A.6A develop the concept of slope as rate of change and determine slopes from graphs, tables, and algebraic representations A.6B interpret the meaning of slope and intercepts in situations using data, symbolic representations, or graphs A.6C investigate, describe, and predict the effects of changes in m and b on the graph of $y = mx + b$ A.6D graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and y -intercept	G.7B use slopes and equations of lines to investigate geometric relationships, including parallel lines, perpendicular lines, and special segments of triangles and other polygons G.9A formulate and test conjectures about the properties of parallel and perpendicular lines based on explorations and concrete models	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 M.3C determine the appropriateness of a model for making predictions from a given set of data M.5A use rates, linear functions, and direct variation to solve problems involving personal finance and budgeting, including compensations and deductions M.8A use geometric models available through technology to model growth and decay in areas such as population, biology, and ecology M.8C use direct and inverse variation to describe physical laws such as Hook's, Newton's, and Boyle's laws	2A.4A identify and sketch graphs of parent functions, including linear ($f(x) = x$), quadratic ($f(x) = x^2$), exponential ($f(x) = ax$), and logarithmic ($f(x) = \log ax$) functions, absolute value of x ($f(x) = x $), square root of x ($f(x) = \sqrt{x}$), and reciprocal of x ($f(x) = 1/x$); 2A.4B extend parent functions with parameters such as a in $f(x) = a/x$ and describe the effects of the parameter changes on the graph of parent functions 2A.5B sketch graphs of conic sections to relate simple parameter changes in the equation to corresponding changes in the graph 2A.5D identify the conic section from a given equation	P.1A describe parent functions symbolically and graphically, including $f(x) = xn$, $f(x) = 1n x$, $f(x) = \log_a x$, $f(x) = 1/x$, $f(x) = ex$, $f(x) = x $, $f(x) = ax$, $f(x) = \sin x$, $f(x) = \arcsin x$, etc.; P.2A apply basic transformations, including $a \cdot f(x)$, $f(x) + d$, $f(x - c)$, $f(b \cdot x)$, and compositions with absolute value functions, including $ f(x) $, and $f(x)$, to the parent functions P.3A investigate properties of trigonometric and polynomial functions P.3C use regression to determine the appropriateness of a linear function to model real-life data (including using technology to determine the correlation coefficient);

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			<p>A.6E determine the intercepts of the graphs of linear A.6G relate direct variation to linear functions and solve problems involving proportional change functions and zeros of linear functions from graphs, tables, and algebraic representations</p> <p>A.6F interpret and predict the effects of changing slope and y-intercept in applied situations</p> <p>A.6G relate direct variation to linear functions and solve problems involving proportional change</p> <p>A.9A determine the domain and range for quadratic functions in given situations</p> <p>A.9B investigate, describe, and predict the effects of changes in a on the graph of $y = ax^2 + c$</p> <p>A.9C investigate, describe, and predict the effects of changes in c on the graph of $y = ax^2 + c$</p> <p>A.9D analyze graphs of quadratic functions and draw conclusions</p>			<p>2A.7B use the parent function to investigate, describe, and predict the effects of changes in a, h, and k on the graphs of $y = a(x - h)^2 + k$ form of a function in applied and purely mathematical situations</p> <p>2A.9A 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>2A.10A 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 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>	

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<p>6.4A use tables and symbols to represent and describe proportional and other relationships such as those involving conversions, arithmetic sequences (with a constant rate of change), perimeter and area</p> <p>6.4B use tables of data to generate formulas representing relationships involving perimeter, area, volume of a rectangular prism</p>	<p>7.4A generate formulas involving unit conversions within the same system (customary and metric), perimeter, area, circumference, volume, and scaling</p>	<p>8.4 generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description)</p>	<p>A.1A describe independent and dependent quantities in functional relationships</p> <p>A.1B gather and record data and use data sets to determine functional relationships between quantities</p> <p>A.1C describe functional relationships for given problem situations and write equations or inequalities to answer questions arising from the situations</p> <p>A.1D represent relationships among quantities using concrete models, tables, graphs, diagrams, verbal descriptions, equations, and inequalities</p> <p>A.5C use, translate, and make connections among algebraic, tabular, graphical, or verbal descriptions of linear functions</p> <p>A.10B 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>G.4 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 $y = ax^2 + bx + c$ and the $y = a(x - h)^2 + k$ 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 functions with respect to problem situations</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>
	<p>7.4B graph data to demonstrate relationships in familiar concepts such as conversions, perimeter, area, circumference, volume, and scaling</p>						

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	7.4C use words and symbols to describe the relationship between the terms in an arithmetic sequence (with a constant rate of change) and their positions in the sequence	8.5B find and evaluate an algebraic expression to determine any term in an arithmetic sequence (with a constant rate of change).	A.3A use symbols to represent unknowns and variables A.3B look for patterns and represent generalizations algebraically A.4C connect equation notation with function notation, such as $y = x + 1$ and $f(x) = x + 1$	G.5A use numeric and geometric patterns to develop algebraic expressions representing geometric properties			P.4A represent patterns using arithmetic and geometric sequences and series P.4B use arithmetic, geometric, and other sequences and series to solve real-life problems

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<p>6.5 formulate equations from problem situations described by linear relationships</p>	<p>7.5A use concrete and pictorial models to solve equations and use symbols to record the actions</p>	<p>8.5A predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations</p>	<p>A.1E interpret and make decisions, predictions, and critical judgments from functional relationships</p> <p>A.2C interpret situations in terms of given graphs or creates situations that fit given graphs</p> <p>A.7B 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>A.8B solve systems of linear equations using concrete models, graphs, tables, and algebraic methods</p> <p>A.10A solve quadratic equations using concrete models, tables, graphs, and algebraic methods</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 using discriminants and solve quadratic equations using the quadratic formula</p> <p>2A.8D solve quadratic equations and inequalities using graphs, tables, and algebraic methods</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 tables</p>	<p>P.6B analyze and solve vector problems generated by real-life situations</p>

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	7.5B formulate problem situations when given a simple equation and formulate an equation when given a problem situation		<p>A.7A analyze situations involving linear functions and formulate linear equations or inequalities to solve problems</p> <p>A.8A analyze situations and formulate systems of linear equations in two unknowns to solve problems</p> <p>A.11B analyze data and represent situations involving inverse variation using concrete models, tables, graphs, or algebraic methods</p> <p>A.11C analyze data and represent situations involving exponential growth and decay using concrete models, tables, graphs, or algebraic methods</p>	G.7C derive and use formulas involving length, slope, and midpoint	M.9B use geometric transformations, proportions, and periodic motion to describe mathematical patterns and structure in music	<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>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.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> <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>
6.6A use angle measurements to classify angles as acute, obtuse, or right	7.6A use angle measurements to classify pairs of angles as complementary or supplementary						
6.6B identify relationships involving angles in triangles and quadrilaterals	7.6B use properties to classify triangles and quadrilaterals			G.9B formulate and test conjectures about the properties and attributes of polygons and their component parts based on explorations and concrete models			

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6.6C describe the relationship between radius, diameter, and circumference of a circle							
	7.6C use properties to classify three-dimensional figures, including pyramids, cones, prisms, and cylinders			<p>G.2B make conjectures about angles, lines, polygons, circles, and three-dimensional figures and determine the validity of the conjectures, choosing from a variety of approaches such as coordinate, transformational, or axiomatic</p> <p>G.9D analyze the characteristics of polyhedra and other three-dimensional figures and their component parts based on explorations and concrete models</p>			
	7.6D use critical attributes to define similarity	8.6A generate similar figures using dilations including enlargements and reductions		<p>G.2A use constructions to explore attributes of geometric figures and to make conjectures about geometric relationships</p> <p>G.11A use and extend similarity properties and transformations to explore and justify conjectures about geometric figures</p> <p>G.11B use ratios to solve problems involving similar figures</p> <p>G.11C develop, apply, and justify triangle similarity relationships, such as right triangle ratios, trigonometric ratios, and Pythagorean triples using a variety of methods</p>			

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6.7 locate and name points on a coordinate plane using ordered pairs of non-negative rational numbers	7.7A locate and name points on a coordinate plane using ordered pairs of integers	8.7D locate and name points on a coordinate plane using ordered pairs of rational numbers		G.7A use one- and two-dimensional coordinate systems to represent points, lines, rays, line segments, and figures			
	7.7B graph reflections across the horizontal or vertical axis and graph translations on a coordinate plane	8.6B graph dilations, reflections, and translations on a coordinate plane		G.5C use properties of transformations and their compositions to make connections between mathematics and the real world, such as tessellations G.10A use congruence transformations to make conjectures and justify properties of geometric figures including figures represented on a coordinate plane		2A.5C identify symmetries from graphs of conic sections	P.1C describe symmetry of graphs of even and odd functions
	7.8A sketch three-dimensional figures when given the top, side, and front views	8.7A draw three-dimensional figures from different perspectives		G.6A describe and draw the intersection of a given plane with various three-dimensional geometric figures G.6C use orthographic and isometric views of three-dimensional geometric figures to represent and construct three-dimensional geometric figures and solve problems		2A.5A describe a conic section as the intersection of a plane and a cone	
		8.7C use pictures or models to demonstrate the Pythagorean Theorem					
	7.8B make a net (two-dimensional model) of the surface area of a three-dimensional figure						
	7.8C use geometric concepts and properties to solve problems in fields such as art and architecture	8.7B 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		

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6.8A estimate measurements (including circumference) and evaluate reasonableness of results	7.9A estimate measurements and solve application problems involving length (including perimeter and circumference) and area of polygons and other shapes			G.8A find areas of regular polygons, circles, and composite figures			
		8.8A find lateral and total surface area of prisms, pyramids, and cylinders using concrete models and nets (two-dimensional models);		G.6B use nets to represent and construct three-dimensional geometric figures G.8D find surface areas and volumes of prisms, pyramids, spheres, cones, cylinders, and composites of these figures in problem situations			
	7.9B connect models for volume of prisms (triangular and rectangular) and cylinders to formulas of prisms (triangular and rectangular) and cylinders	8.8B connect models of prisms, cylinders, pyramids, spheres, and cones to formulas for volume of these objects					
6.8B select and use appropriate units, tools, or formulas to measure and to solve problems involving length (including perimeter), area, time, temperature, volume, and weight	7.9C estimate measurements and solve application problems involving volume of prisms (rectangular and triangular) and cylinders	8.8C estimate measurements and use formulas to solve application problems involving lateral and total surface area and volume of cylinders					
6.8C measure angles							
6.8D convert measures within the same measurement system (customary and metric) based on relationships between units							
		8.9A use the Pythagorean Theorem to solve real-life problems		G.5D 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 G.8C 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 use proportional relationships in similar two-dimensional figures or similar three-dimensional figures to find missing measurements		G.10B justify and apply triangle congruence relationships			

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		8.10A describe the resulting effects on perimeter and area when dimensions of a shape are changed proportionally		G.11D 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 describe the resulting effect on volume when dimensions of a solid are changed proportionally					
6.9A construct sample spaces using lists and tree diagrams	7.10A construct sample spaces for simple or composite experiments						
6.9B find the probabilities of a simple event and its complement and describe the relationship between the two.	7.10B find the probability of independent events	8.11A find the probabilities of dependent and independent events					
		8.11B 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, etc		
		8.11C select and use different models to simulate an event		G.8E use area models to connect geometry to probability and statistics			
6.10A select and use an appropriate representation for presenting and displaying different graphical representations of the same data including line plot, line graph, bar graph, and stem and leaf plot	7.11A select and use an appropriate representation for presenting and displaying relationships among collected data, including line plot, line graph, bar graph, stem and leaf plot, circle graph, and Venn diagrams, and justify the selection	8.12C 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		

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	7.11B make inferences and convincing arguments based on an analysis of given or collected data	8.12B draw conclusions and make predictions by analyzing trends in scatterplots	A.2D collect and organize data, make and interpret 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			2A.1B collect and organize data, make and interpret scatterplots, fit the graph of a function to the data, interpret the results, and proceed to model, predict, and make decisions and critical judgments	
6.10B identify mean (using concrete objects and pictorial models), median, mode, and range of a set of data	7.12A describe a set of data using mean, median, mode, and range						
6.10C sketch circle graphs to display data							
6.10D solve problems by collecting, organizing, displaying, and interpreting data							
	7.12B choose among mean, median, mode, or range to describe a set of data and justify the choice for a particular situation	8.12A use variability (range, including interquartile range (IQR)) and select the appropriate measure of central tendency 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 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 recognize misuses of graphical or numerical information and evaluate predictions and conclusions based on data analysis					

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<p>6.11A identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics</p>	<p>7.13A identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics</p>	<p>8.14A identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics</p>		<p>G.1B recognize the historical development of geometric systems and know mathematics is developed for a variety of purposes</p>	<p>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 investigate automobile financing and compare buying and leasing a vehicle M.7A analyze types of savings options involving simple and compound interest and compare relative advantages of these options M.7B analyze and compare coverage options and rates in insurance M.7C investigate and compare investment options including stocks, bonds, annuities, and retirement plans</p>		
<p>6.11B use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness</p>	<p>7.13B use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness</p>	<p>8.14B use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness</p>			<p>M.1C select a method to solve a problem, defend the method, and justify the reasonableness of the results</p>		

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6.11C 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	7.13C 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	8.14C 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			M.1A compare and analyze various methods for solving a real-life problem M.1B use multiple approaches (algebraic, graphical, and geometric methods) to solve problems from a variety of disciplines		
6.11D select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems	7.13D select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems	8.14D select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems					
6.12A communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models	7.14A communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models	8.15A communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models		G.1A develop an awareness of the structure of a mathematical system, connecting definitions, postulates, logical reasoning, and theorems G.1C compare and contrast the structures and implications of Euclidean and non-Euclidean geometries	M.3B communicate methods used, analyses conducted, and conclusions drawn for a data-analysis project by written report, visual display, oral report, or multi-media presentation		
6.12B evaluate the effectiveness of different representations to communicate ideas	7.14B evaluate the effectiveness of different representations to communicate ideas	8.15B evaluate the effectiveness of different representations to communicate ideas					

PISD Vertical Alignment
of Student Expectations
Mathematics Grades 6-12

6th Grade	7th Grade	8th Grade	Algebra	Geometry	Math Models	Algebra II	Precalculus
6.13A make conjectures from patterns or sets of examples and nonexamples	7.15A make conjectures from patterns or sets of examples and nonexamples	8.16A make conjectures from patterns or sets of examples and nonexamples		G.3A determine the validity of a conditional statement, its converse, inverse, and contrapositive G.3B construct and justify statements about geometric figures and their properties G.3C use logical reasoning to prove statements are true and find counter examples to disprove statements that are false G.3D use inductive reasoning to formulate a conjecture G.3E use deductive reasoning to prove a statement			
6.13B validate his/her conclusions using mathematical properties and relationships	7.15B validate his/her conclusions using mathematical properties and relationships	8.16B validate his/her conclusions using mathematical properties and relationships		G.5B use numeric and geometric patterns to make generalizations about geometric properties, including properties of polygons, ratios in similar figures and solids, and angle relationships in polygons and circles G.9C formulate and test conjectures about the properties and attributes of circles and the lines that intersect them based on explorations and concrete models			

PISD Vertical Alignment
of Student Expectations
Mathematics Grades 6-12

6th Grade	7th Grade	8th Grade	Algebra	Geometry	Math Models	Algebra II	Precalculus
						<p>2A.4C describe and analyze the relationship between a function and its inverse</p> <p>2A.9G connect inverses of square root functions with quadratic functions</p> <p>2A.11A develop the definition of logarithms by exploring and describing the relationship between exponential functions and their inverses</p>	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