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Correlation of Texas Essential Knowledge and Skills (TEKS) for Algebra I and Geometry to *Moving with Math* SUMS

		Student Book	Skill Builders
	ALGEBRA I		
A.1	**Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding.**		
(A)	apply mathematics to problems arising in everyday life, society, and the workplace	throughout	throughout
(B)	use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution	throughout	throughout
(C)	select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems	throughout	throughout
(D)	communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate	throughout	throughout
(E)	create and use representations to organize, record, and communicate mathematical ideas	throughout	throughout
(F)	analyze mathematical relationships to connect and communicate mathematical ideas	throughout	throughout
(G)	display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication	throughout	throughout
A.2	**Linear functions, equations, and inequalities. The student applies the mathematical process standards when using properties of linear functions to write and represent in multiple ways, with and without technology, linear equations, inequalities, and systems of equations.**		
(A)	determine the domain and range of a linear function in mathematical problems; determine reasonable domain and range values for real-world situations, both continuous and discrete; and represent domain and range using inequalities		
(B)	write linear equations in two variables in various forms, including $y = mx + b$, $Ax + By = C$, and $y – y1 = m(x – x1)$, given one point and the slope and given two points	214	
(C)	write linear equations in two variables given a table of values, a graph, and a verbal description	217	
(D)	write and solve equations involving direct variation	196, 197	188
(E)	write the equation of a line that contains a given point and is parallel to a given line	215	

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(F)	write the equation of a line that contains a given point and is perpendicular to a given line		
(G)	write an equation of a line that is parallel or perpendicular to the X or Y axis and determine whether the slope of the line is zero or undefined	209	
(H)	write linear inequalities in two variables given a table of values, a graph, and a verbal description		
(I)	write systems of two linear equations given a table of values, a graph, and a verbal description		
A.3	**Linear functions, equations, and inequalities. The student applies the mathematical process standards when using graphs of linear functions, key features, and related transformations to represent in multiple ways and solve, with and without technology, equations, inequalities, and systems of equations.**		
(A)	determine the slope of a line given a table of values, a graph, two points on the line, and an equation written in various forms, including y = mx + b, Ax + By = C, and y – y1 = m(x – x1)	210-213	171
(B)	calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems		
(C)	graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems	208	181, 182
(D)	graph the solution set of linear inequalities in two variables on the coordinate plane		
(E)	determine the effects on the graph of the parent function f(x) = x when f(x) is replaced by af(x), f(x) + d, f(x – c), f(bx) for specific values of a, b, c, and d		
(F)	graph systems of two linear equations in two variables on the coordinate plane and determine solutions if they exist	218	184
(G)	estimate graphically the solutions to systems of two linear equations with two variables in real-world problems		
(H)	graph the solution set of systems of two linear inequalities in two variables on the coordinate plane		
A.4	**Linear functions, equations, and inequalities. The student applies the mathematical process standards to formulate statistical relationships and evaluate their reasonableness based on real-world data.**		
(A)	calculate, using technology, the correlation coefficient between two quantitative variables and interpret this quantity as a measure of the strength of the linear association		
(B)	compare and contrast association and causation in real-world problems		
(C)	write, with and without technology, linear functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems		
A.5	**Linear functions, equations, and inequalities. The student applies the mathematical process standards to solve, with and without technology, linear equations and evaluate the reasonableness of their solutions.**		

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(A)	solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides	164, 165	175
(B)	solve linear inequalities in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides	167-172	176
(C)	solve systems of two linear equations with two variables for mathematical and real-world problems	218, 219	184
A.6	**Quadratic functions and equations. The student applies the mathematical process standards when using properties of quadratic functions to write and represent in multiple ways, with and without technology, quadratic equations.**		
(A)	determine the domain and range of quadratic functions and represent the domain and range using inequalities		
(B)	write equations of quadratic functions given the vertex and another point on the graph, write the equation in vertex form ($f(x) = a(x – h)2 + k$), and rewrite the equation from vertex form to standard form ($f(x) = a2 + bx + c$)		
(C)	write quadratic functions when given real solutions and graphs of their related equations		
A.7	**Quadratic functions and equations. The student applies the mathematical process standards when using graphs of quadratic functions and their related transformations to represent in multiple ways and determine, with and without technology, the solutions to equations.**		
(A)	graph quadratic functions on the coordinate plane and use the graph to identify key attributes, if possible, including x-intercept, y-intercept, zeros, maximum value, minimum values, vertex, and the equation of the axis of symmetry	220	
(B)	describe the relationship between the linear factors of quadratic expressions and the zeros of their associated quadratic functions		
(C)	determine the effects on the graph of the parent function $f(x) = x2$ when $f(x)$ is replaced by $af(x)$, $f(x) + d$, $f(x – c)$, $f(bx)$ for specific values of a, b, c, and d		
A.8	**Quadratic functions and equations. The student applies the mathematical process standards to solve, with and without technology, quadratic equations and evaluate the reasonableness of their solutions. The student formulates statistical relationships and evaluates their reasonableness based on real-world data.**		
(A)	solve quadratic equations having real solutions by factoring, taking square roots, completing the square, and applying the quadratic formula		
(B)	write, using technology, quadratic functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems		

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A.9	**Exponential functions and equations. The student applies the mathematical process standards when using properties of exponential functions and their related transformations to write, graph, and represent in multiple ways exponential equations and evaluate, with and without technology, the reasonableness of their solutions. The student formulates statistical relationships and evaluates their reasonableness based on real-world data.**		
(A)	determine the domain and range of exponential functions of the form f(x) = abx and represent the domain and range using inequalities		
(B)	interpret the meaning of the values of a and b in exponential functions of the form f(x) = abx in real-world problems		
(C)	write exponential functions in the form f(x) = abx (where b is a rational number) to describe problems arising from mathematical and real-world situations, including growth and decay		
(D)	graph exponential functions that model growth and decay and identify key features, including y-intercept and asymptote, in mathematical and real-world problems		
(E)	write, using technology, exponential functions that provide a reasonable fit to data and make predictions for real-world problems		
A.10	**Number and algebraic methods. The student applies the mathematical process standards and algebraic methods to rewrite in equivalent forms and perform operations on polynomial expressions.**		
(A)	add and subtract polynomials of degree one and degree two	185, 186	
(B)	multiply polynomials of degree one and degree two	187-190	
(C)	determine the quotient of a polynomial of degree one and polynomial of degree two when divided by a polynomial of degree one and polynomial of degree two when the degree of the divisor does not exceed the degree of the dividend		
(D)	rewrite polynomial expressions of degree one and degree two in equivalent forms using the distributive property	187	
(E)	factor, if possible, trinomials with real factors in the form ax2 + bx + c, including perfect square trinomials of degree two		
(F)	decide if a binomial can be written as the difference of two squares, and, if possible, use the structure of a difference of two squares to rewrite the binomial		
A.11	**Number and algebraic methods. The student applies the mathematical process standards and algebraic methods to rewrite algebraic expressions into equivalent forms.**		
(A)	simplify numerical radical expressions involving square roots	5, 183	
(B)	simplify numeric and algebraic expressions using the laws of exponents, including integral and rational exponents	4, 7, 12, 179, 181	32, 33, 95
A.12	**Number and algebraic methods. The student applies the mathematical process standards and algebraic methods to write, solve, analyze, and evaluate equations, relations, and functions.**		
(A)	decide whether relations represented verbally, tabularly, graphically, and symbolically define a function		
(B)	evaluate functions, expressed in function notation, given one or more elements in their domains		

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(C)	identify terms of arithmetic and geometric sequences when the sequences are given in function form using recursive processes		
(D)	write a formula for the nth term of arithmetic and geometric sequences, given the value of several of their terms		
(E)	solve mathematic and scientific formulas, and other literal equations, for a specified variable		
	GEOMETRY		
G.1	**Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding.**		
(A)	apply mathematics to problems arising in everyday life, society, and the workplace	throughout	throughout
(B)	use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution	throughout	throughout
(C)	select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems	throughout	throughout
(D)	communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate	throughout	throughout
(E)	create and use representations to organize, record, and communicate mathematical ideas	throughout	throughout
(F)	analyze mathematical relationships to connect and communicate mathematical ideas	throughout	throughout
(G)	display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication	throughout	throughout
G.2	**Coordinate and transformational geometry. The student uses the process skills to understand the connections between algebra and geometry and uses the one- and two-dimensional coordinate systems to verify geometric conjectures.**		
(A)	determine the coordinates of a point that is a given fractional distance less than one from one end of a line segment to the other in one- and two-dimensional coordinate systems, including finding the midpoint		
(B)	derive and use the distance, slope, and midpoint formulas to verify geometric relationships, including congruence of segments and parallelism or perpendicularity of pairs of lines		
(C)	determine an equation of a line parallel or perpendicular to a given line that passes through a given point	215, 216	183
G.3	**Coordinate and transformational geometry. The student uses the process skills to generate and describe rigid transformations (translation, reflection, and rotation) and non-rigid transformations (dilations that preserve similarity and reductions and enlargements that do not preserve similarity).**		
(A)	describe and perform transformations of figures in a plane using coordinate notation	95	

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(B)	determine the image or pre-image of a given two-dimensional figure under a composition of rigid transformations, a composition of non-rigid transformations, and a composition of both, including dilations where the center can be any point in the plane		
(C)	identify the sequence of transformations that will carry a given pre-image onto an image on and off the coordinate plane		
(D)	identify and distinguish between reflectional and rotational symmetry in a plane figure		
G.4	**Logical argument and constructions. The student uses the process skills with deductive reasoning to understand geometric relationships.**		
(A)	distinguish between undefined terms, definitions, postulates, conjectures, and theorems		
(B)	identify and determine the validity of the converse, inverse, and contrapositive of a conditional statement and recognize the connection between a biconditional statement and a true conditional statement with a true converse		
(C)	verify that a conjecture is false using a counterexample		
(D)	compare geometric relationships between Euclidean and spherical geometries, including parallel lines and the sum of the angles in a triangle		
G.5	**Logical argument and constructions. The student uses constructions to validate conjectures about geometric figures.**		
(A)	investigate patterns to make conjectures about geometric relationships, including angles formed by parallel lines cut by a transversal, criteria required for triangle congruence, special segments of triangles, diagonals of quadrilaterals, interior and exterior angles of polygons, and special segments and angles of circles choosing from a variety of tools		
(B)	construct congruent segments, congruent angles, a segment bisector, an angle bisector, perpendicular lines, the perpendicular bisector of a line segment, and a line parallel to a given line through a point not on a line using a compass and a straightedge		147
(C)	use the constructions of congruent segments, congruent angles, angle bisectors, and perpendicular bisectors to make conjectures about geometric relationships		
(D)	verify the Triangle Inequality theorem using constructions and apply the theorem to solve problems	96, 97	
G.6	**Proof and congruence. The student uses the process skills with deductive reasoning to prove and apply theorems by using a variety of methods such as coordinate, transformational, and axiomatic and formats such as two-column, paragraph, and flow chart.**		
(A)	verify theorems about angles formed by the intersection of lines and line segments, including vertical angles, and angles formed by parallel lines cut by a transversal, and prove equidistance between the endpoints of a segment and points on its perpendicular bisector, and apply these relationships to solve problems		

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(B)	prove two triangles are congruent by applying the Side-Angle-Side, Angle-Side-Angle, Side-Side-Side, Angle-Angle-Side, and Hypotenuse-Leg conguence conditions		
(C)	apply the definition of congruence, in terms of rigid transformations, to identify congruent figures and their corresponding sides and angles		
(D)	verify theorems about the relationships in triangles, including proof of the Pythagorean Theorem, the sum of interior angles, base angles of isosceles triangles, midsegments, and medians, and apply these relationships to solve problems		
(E)	prove a quadrilateral is a parallelogram, rectangle, square, or rhombus using opposite sides, opposite angles, or diagonals and apply these relationships to solve problems		
G.7	**Similarity, proof, and trigonometry. The student uses process skills in applying similarity to solve problems.**		
(A)	apply the definition of similarity in terms of a dilation to identify similar figures and their proportional sides and the congruent corresponding angles		
(B)	apply the Angle-Angle criterion to verify similar triangles and apply the proportionality of the corresponding sides to solve problems		
G.8	**Similarity, proof, and trigonometry. The student uses process skills with deductive reasoning to prove and apply theorems by using a variety of methods such as coordinate, transformational, and axiomatic and formats such as two-column, paragraph, and flow chart.**		
(A)	prove theorems about similar triangles, including the Triangle Proportionality theorem, and apply these theorems to solve problems		
(B)	identify and apply the relationships that exist when an altitude is drawn to the hypotenuse of a right triangle, including the geometric mean, to solve problems		
G.9	**Similarity, proof, and trigonometry. The student uses process skills to understand and apply relationships in right triangles.**		
(A)	determine the lengths of sides and measures of angles in a right triangle by applying the trigonometric ratios sine, cosine, and tangent to solve problems		
(B)	apply the relationships in special right triangles 30-60-90 and 45-45-90 and the Pythagorean theorem, including Pythagorean triples, to solve problems	97	
G.10	**Two-dimensional and three-dimensional figures. The student uses the process skills to recognize characteristics and dimensional changes of two- and three-dimensional figures.**		
(A)	identify the shapes of two-dimensional cross-sections of prisms, pyramids, cylinders, cones, and spheres and identify three-dimensional objects generated by rotations of two-dimensional shapes		
(B)	determine and describe how changes in the linear dimensions of a shape affect its perimeter, area, surface area, or volume, including proportional and non-proportional dimensional changes		139

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G.11	**Two-dimensional and three-dimensional figures. The student uses the process skills in the application of formulas to determine measures of two- and three-dimensional figures.**		
(A)	apply the formula for the area of regular polygons to solve problems using appropriate units of measure	103-106	124-126
(B)	determine the area of composite two-dimensional figures comprised of a combination of triangles, parallelograms, trapezoids, kites, regular polygons, or sectors of circles to solve problems using appropriate units of measure	112, 113	138
(C)	apply the formulas for the total and lateral surface area of three-dimensional figures, including prisms, pyramids, cones, cylinders, spheres, and composite figures, to solve problems using appropriate units of measure	116	139
(D)	apply the formulas for the volume of three-dimensional figures, including prisms, pyramids, cone, cylinders, spheres, and composite figures, to solve problems using appropriate units of measure	109-111, 117, 118	130
G.12	**Circles. The student uses the process skills to understand geometric relationships and apply theorems and equations about circles.**		
(A)	apply theorems about circles, including relationships among angles, radii, chords, tangents, and secants, to solve non-contextual problems		
(B)	apply the proportional relationship between the measure of an arc length of a circle and the circumference of the circle to solve problems		
(C)	apply the proportional relationship between the measure of the area of a sector of a circle and the area of the circle to solve problems		
(D)	describe the radian measure of an angle as the ratio of the length of an arc intercepted by a central angle and the radius of the circle		
(E)	show that the equation of a circle with center at the origin and radius r is $x2 + y2 = r2$ and determine the equation for the graph of a circle with radius r and center (h, k), $(x – h)2 + (y – k)2 = r2$		
G.13	**Probability. The student uses the process skills to understand probability in real-world situations and how to apply independence and dependence of events.**		
(A)	develop strategies to use permutations and combinations to solve contextual problems	126, 129	156
(B)	determine probabilities based on area to solve contextual problems		
(C)	identify whether two events are independent and compute the probability of the two events occurring together with or without replacement	127, 128	
(D)	apply conditional probability in contextual problems		
(E)	apply independence in contextual problems		