Algebra 1 TEKS and Related Prior Learning TEKS

	Algebra 1 TEKS/SE	Prior Learning TEKS/SE
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. The student is expected to:	
A.2A	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	8.5G identify functions using sets of ordered pairs, tables, mappings, and graphs.
A.2B	write linear equations in two variables in various forms, including $y = mx + b$, $Ax + By = C$, and $y - y_1 = m(x - x_1)$, given one point and the slope and given two points	8.5B represent linear non- proportional situations with tables, graphs, and equations in the form of $y = mx + b$, where $b \neq 0$.
A.2C	write linear equations in two variables given a table of values, a graph, and a verbal description	8.5I write an equation in the form $y = mx + b$ to model a linear relationship between two quantities using verbal, numerical, tabular, and graphical representations.
A.2D	write and solve equations involving direct variation	8.5A represent linear proportional situations with tables, graphs, and equations in the form of $y = kx$. 8.5E solve problems involving direct variation
A.2E	write the equation of a line that contains a given point and is parallel to a given line	8.5F distinguish between proportional and non-proportional situations using tables, graphs, and equations in the form $y = kx$ or $y = mx + b$, where $b \neq 0$.
A.2F	write the equation of a line that contains a given point and is perpendicular to a given line	8.5F distinguish between proportional and non-proportional situations using tables, graphs, and equations in the form $y = kx$ or $y = mx + b$, where $b \neq 0$.
A.2G	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	8.5F distinguish between proportional and non-proportional situations using tables, graphs, and equations in the form $y = kx$ or $y = mx + b$, where $b \neq 0$.
A.2H	write linear inequalities in two variables given a table of values, a graph, and a verbal description	8.8A write one-variable equations or inequalities with variables on both sides that represent problems using rational number coefficients and constants.
A.2I	write systems of two linear equations given a table of values, a graph, and a verbal description	8.5H identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems. 8.8A write one-variable equations or inequalities with variables on both sides that represent problems using rational number coefficients and constants.

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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. The student is expected to:	
A.3A	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 $y - y_1 = m(x - x_1)$	8.4A use similar right triangles to develop an understanding that slope, *m*, given as the rate comparing the change in *y*-values to the change in *x*- values, $(y2 - y1)/ (x2 - x1)$, is the same for any two points $(x1, y1)$ and $(x2, y2)$ on the same line.
A.3B	calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems	8.4B graph proportional relationships, interpreting the unit rate as the slope of the line that models the relationship.
A.3C	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	8.4C use data from a table or graph to determine the rate of change or slope and *y*- intercept in mathematical and real-world problems.
A.3D	graph the solution set of linear inequalities in two variables on the coordinate plane	
A.3E	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*	8.10C explain the effect of translations, reflections over the *x*- or *y*-axis, and rotations limited to 90°, 180°, 270°, and 360° as applied to two- dimensional shapes on a coordinate plane using an algebraic representation.
A.3F	graph systems of two linear equations in two variables on the coordinate plane and determine the solutions if they exist	8.9A identify and verify the values of *x* and *y* that simultaneously satisfy two linear equations in the form $y = mx + b$ from the intersections of the graphed equations.
A.3G	estimate graphically the solutions to systems of two linear equations with two variables in real-world problems	8.9A identify and verify the values of *x* and *y* that simultaneously satisfy two linear equations in the form $y = mx + b$ from the intersections of the graphed equations.
A.3H	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. The student is expected to:	
A.4A	calculate, using technology, the correlation coefficient between two quantitative variables and interpret this quantity as a measure of the strength of the linear association	8.11A construct a scatterplot and describe the observed data to address questions of association such as linear, non-linear, and no association between bivariate data.
A.4B	compare and contrast association and causation in real-world problems	8.5C contrast bivariate sets of data that suggest a linear relationship with bivariate sets of data that do not suggest a linear relationship from a graphical representation.

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A.4C	write, with and without technology, linear functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems	8.5D use a trend line that approximates the linear relationship between bivariate sets of data to make predictions.
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. The student is expected to:	
A.5A	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	8.8C model and solve one- variable equations with variables on both sides of the equal sign that represent mathematical and real-world problems using rational number coefficients and constants.
A.5B	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	8.8C model and solve one- variable equations with variables on both sides of the equal sign that represent mathematical and real-world problems using rational number coefficients and constants.
A.5C	solve systems of two linear equations with two variables for mathematical and real-world problems	
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. The student is expected to:	
A.6A	determine the domain and range of quadratic functions and represent the domain and range using inequalities	8.5G identify functions using sets of ordered pairs, tables, mappings, and graphs.
A.6B	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 ($f(x) = ax^2 + bx + c$)	
A.6C	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. The student is expected to:	
A.7A	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	
A.7B	describe the relationship between the linear factors of quadratic expressions and the zeros of their associated quadratic functions	
A.7C	determine the effects on the graph of the parent function $f(x) = x^2$ 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	8.10C explain the effect of translations, reflections over the *x*- or *y*-axis, and rotations limited to 90°, 180°, 270°, and 360° as applied to two- dimensional shapes on a coordinate plane using an algebraic representation.

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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. The student is expected to:	
A.8A	solve quadratic equations having real solutions by factoring, taking square roots, completing the square, and applying the quadratic formula	
A.8B	write, using technology, quadratic functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems	
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. The student is expected to:	
A.9A	determine the domain and range of exponential functions of the form $f(x) = ab^x$ and represent the domain and range using inequalities	
A.9B	interpret the meaning of the values of a and b in exponential functions of the form $f(x) = ab^x$ in real-world problems	
A.9C	write exponential functions in the form $f(x) = ab^x$ (where b is a rational number) to describe problems arising from mathematical and real-world situations, including growth and decay	
A.9D	graph exponential functions that model growth and decay and identify key features, including y-intercept and asymptote, in mathematical and real-world problems	
A.9E	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. The student is expected to:	
A.10A	add and subtract polynomials of degree one and degree two	7.3A add, subtract, multiply, and divide rational numbers fluently. 7.3B apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers.
A.10B	multiply polynomials of degree one and degree two	7.3A add, subtract, multiply, and divide rational numbers fluently.
A.10C	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	7.3B apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers.

A.10D	rewrite polynomial expressions of degree one and degree two in equivalent forms using the distributive property	7.3B apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers.
A.10E	factor, if possible, trinomials with real factors in the form $ax^2 + bx + c$, including perfect square trinomials of degree two	
A.10F	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. The student is expected to:	
A.11A	simplify numerical radical expressions involving square roots	
A.11B	simplify numeric and algebraic expressions using the laws of exponents, including integral and rational exponents	
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. The student is expected to	
A.12A	decide whether relations represented verbally, tabularly, graphically, and symbolically define a function	
A.12B	evaluate functions, expressed in function notation, given one or more elements in their domains	
A.12C	identify terms of arithmetic and geometric sequences when the sequences are given in function form using recursive processes	
A.12D	write a formula for the n^{th} term of arithmetic and geometric sequences, given the value of several of their terms	
A.12E	solve mathematic and scientific formulas, and other literal equations, for a specified variable	