

Newly Adopted
MATH TEKS
Checklists

Algebra 1,
Algebra 2
&
Geometry

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Mathematical Process Standards

	Standard Addressed			
1a	apply mathematics to problems arising in everyday life, society, and the workplace			
1b	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			
1c	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			
1d	communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate			
1e	create and use representations to organize, record, and communicate mathematical ideas			
1f	analyze mathematical relationships to connect and communicate mathematical ideas			
1g	display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication			

Linear Functions, Equations and Inequalities Standards

	Standard Addressed			
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			
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			
2c	write linear equations in two variables given a table of values, a graph, and a verbal description			
2d	write and solve equations involving direct variation			
2e	write the equation of a line that contains a given point and is parallel to a given line			
2f	write the equation of a line that contains a given point and is perpendicular to a given line			
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			
2h	write linear inequalities in two variables given a table of values, a graph, and a verbal description			
2i	write systems of two linear equations given a table of values, a graph, and a verbal description			

Linear Functions, Equations and Inequalities Standards

	Standard Addressed			
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)$			
3b	calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems			
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			
3d	graph the solution set of linear inequalities in two variables on the coordinate plane			
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			
3f	graph systems of two linear equations in two variables on the coordinate plane and determine the solutions if they exist			
3g	estimate graphically the solutions to systems of two linear equations with two variables in real-world problems			
3h	graph the solution set of systems of two linear inequalities in two variables on the coordinate plane			

Linear Functions, Equations and Inequalities Standards

	Standard Addressed			
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			
4b	compare and contrast association and causation in real-world problems			
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			
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			
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			
5c	solve systems of two linear equations with two variables for mathematical and real-world problems			

Quadratic Functions and Equations Standards

	Standard Addressed			
6a	determine the domain and range of quadratic functions and represent the domain and range using inequalities			
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 ($f(x) = ax^2 + bx + c$)			
6c	write quadratic functions when given real solutions and graphs of their related equations			
7a	graph quadratic functions on the coordinate plane and use the graph to identify key attributes, if possible, including x-intercept, y-intercept, zeroes, maximum value, minimum values, vertex, and the equation of the axis of symmetry			
7b	describe the relationship between the linear factors of quadratic expressions and the zeroes of their associated quadratic functions			
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			
8a	solve quadratic equations having real solutions by factoring, taking square roots, completing the square, and applying the quadratic formula			
8b	write, using technology, quadratic functions that provide a reasonable fit to data to estimate solutions and make predictions for real-world problems			

Exponential Functions and Equations Standards

	Standard Addressed			
9a	determine the domain and range of exponential functions of the form $f(x) = ab^x$ and represent the domain and range using inequalities			
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			
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			
9d	graph exponential functions that model growth and decay and identify key features, including y -intercept and asymptote, in mathematical and real-world problems			
9e	write, using technology, exponential functions that provide a reasonable fit to data and make predictions for real-world problems			

Numbers and Algebraic Methods Standards

	Standard Addressed			
10a	add and subtract polynomials of degree one and degree two			
10b	multiply polynomials of degree one and degree two			
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			
10d	rewrite polynomial expressions of degree one and degree two in equivalent forms using the distributive property			
10e	factor, if possible, trinomials with real factors in the form $ax^2 + bx + c$, including perfect square trinomials of degree two			
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			
11a	simplify numerical radical expressions involving square roots			
11b	simplify numeric and algebraic expressions using the laws of exponents, including integral and rational exponents			

Numbers and Algebraic Methods Standards cont.

	Standard Addressed			
I2a	decide whether relations represented verbally, tabularly, graphically, and symbolically define a function			
I2b	evaluate functions, expressed in function notation, given one or more elements in their domains			
I2c	identify terms of arithmetic and geometric sequences when the sequences are given in function form using recursive processes			
I2d	write a formula for the n th term of arithmetic and geometric sequences, given the value of several of their terms			
I2e	solve mathematic and scientific formulas, and other literal equations, for a specified variable			

Mathematical Process Standards

	Standard Addressed			
1a	apply mathematics to problems arising in everyday life, society, and the workplace			
1b	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			
1c	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			
1d	communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate			
1e	create and use representations to organize, record, and communicate mathematical ideas			
1f	analyze mathematical relationships to connect and communicate mathematical ideas			
1g	display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication			

Attributes of Functions and their Inverses Standards

	Standard Addressed			
2a	graph the functions $f(x)=\sqrt{x}$, $f(x)=1/x$, $f(x)=x^3$, $f(x)=\sqrt[3]{x}$, $f(x)=bx$, $f(x)= x $, and $f(x)=\log_b(x)$ where b is 2, 10, and e , and, when applicable, analyze the key attributes such as domain, range, intercepts, symmetries, asymptotic behavior, and maximum and minimum given an interval			
2b	graph and write the inverse of a function using notation such as $f^{-1}(x)$			
2c	describe and analyze the relationship between a function and its inverse (quadratic and square root, logarithmic and exponential), including the restriction(s) on domain, which will restrict its range			
2d	use the composition of two functions, including the necessary restrictions on the domain, to determine if the functions are inverses of each other			

Systems of Equations and Inequalities Standards

	Standard Addressed			
3a	Formulate systems of equations, including systems consisting of three linear equations in three variables and systems consisting of two equations, the first linear and the second quadratic			
3b	solve systems of three linear equations in three variables by using Gaussian elimination, technology with matrices, and substitution			
3c	solve, algebraically, systems of two equations in two variables consisting of a linear equation and a quadratic equation			
3d	determine the reasonableness of solutions to systems of a linear equation and a quadratic equation in two variables			
3e	Formulate systems of at least two linear inequalities in two variables			
3f	solve systems of two or more linear inequalities in two variables			
3g	determine possible solutions in the solution set of systems of two or more linear inequalities in two variables			

Quadratic and Square Root Functions, Equations and Inequalities Standards

	Standard Addressed			
4a	write the quadratic function given three specified points in the plane			
4b	write the equation of a parabola using given attributes, including vertex, focus, directrix, axis of symmetry, and direction of opening			
4c	determine the effect on the graph of $f(x) = \sqrt{x}$ when $f(x)$ is replaced by $af(x)$, $f(x) + d$, $f(bx)$, and $f(x - c)$ for specific positive and negative values of a , b , c , and d			
4d	transform a quadratic function $f(x) = ax^2 + bx + c$ to the form $f(x) = a(x - h)^2 + k$ to identify the different attributes of $f(x)$			
4e	formulate quadratic and square root equations using technology given a table of data			
4f	solve quadratic and square root equations			
4g	identify extraneous solutions of square root equations			
4h	solve quadratic inequalities			

Exponential and Logarithmic Functions and Equations Standards

	Standard Addressed			
5a	determine the effects on the key attributes on the graphs of $f(x) = bx$ and $f(x) = \log_b(x)$ where b is 2, 10, and e when $f(x)$ is replaced by $af(x)$, $f(x) + d$, and $f(x - c)$ for specific positive and negative real values of a , c , and d			
5b	Formulate exponential and logarithmic equations that model real-world situations, including exponential relationships written in recursive notation			
5c	rewrite exponential equations as their corresponding logarithmic equations and logarithmic equations as their corresponding exponential equations			
5d	solve exponential equations of the form $y = abx$ where a is a nonzero real number and b is greater than zero and not equal to one and single logarithmic equations having real solutions			
5e	determine the reasonableness of a solution to a logarithmic equation			

Cubic, Cube Root, Absolute Value and Rational Functions, Equations and Inequalities Standards

	Standard Addressed			
6a	analyze the effect on the graphs of $f(x) = x^3$ and $f(x) = \sqrt[3]{x}$ when $f(x)$ is replaced by $af(x)$, $f(bx)$, $f(x - c)$, and $f(x) + d$ for specific positive and negative real values of a , b , c , and d			
6b	solve cube root equations that have real roots			
6c	analyze the effect on the graphs of $f(x) = x $ when $f(x)$ is replaced by $af(x)$, $f(bx)$, $f(x-c)$, and $f(x) + d$ for specific positive and negative real values of a , b , c , and d			
6d	formulate absolute value linear equations			
6e	solve absolute value linear equations			
6f	solve absolute value linear inequalities			
6g	analyze the effect on the graphs of $f(x) = 1/x$ when $f(x)$ is replaced by $af(x)$, $f(bx)$, $f(x-c)$, and $f(x) + d$ for specific positive and negative real values of a , b , c , and d			
6h	formulate rational equations that model real-world situations			
6i	solve rational equations that have real solutions			
6j	determine the reasonableness of a solution to a rational equation			
6k	determine the asymptotic restrictions on the domain of a rational function and represent domain and range using interval notation, inequalities, and set notation			
6l	formulate and solve equations involving inverse variation			

Number and Algebraic Methods Standards

	Standard Addressed			
7a	add, subtract, and multiply complex numbers			
7b	add, subtract, and multiply polynomials			
7c	determine the quotient of a polynomial of degree three and of degree four when divided by a polynomial of degree one and of degree two			
7d	determine the linear factors of a polynomial function of degree three and of degree four using algebraic methods			
7e	determine linear and quadratic factors of a polynomial expression of degree three and of degree four, including factoring the sum and difference of two cubes and factoring by grouping			
7f	determine the sum, difference, product, and quotient of rational expressions with integral exponents of degree one and of degree two			
7g	rewrite radical expressions that contain variables to equivalent forms			
7h	solve equations involving rational exponents			
7i	write the domain and range of a function in interval notation, inequalities, and set notation			

Data Standards

	Standard Addressed			
8a	analyze data to select the appropriate model from among linear, quadratic, and exponential models			
8b	use regression methods available through technology to write a linear function, a quadratic function, and an exponential function from a given set of data			
8c	predict and make decisions and critical judgments from a given set of data using linear, quadratic, and exponential models			

Mathematical Process Standards

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1c	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			
1d	communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate			
1e	create and use representations to organize, record, and communicate mathematical ideas			
1f	analyze mathematical relationships to connect and communicate mathematical ideas			
1g	display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication			

Coordinate and Transformational Geometry Standards

	Standard Addressed			
2a	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			
2b	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			
2c	determine an equation of a line parallel or perpendicular to a given line that passes through a given point			
3a	describe and perform transformations of figures in a plane using coordinate notation			
3b	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			
3c	identify the sequence of transformations that will carry a given pre-image onto an image on and off the coordinate plane			
3d	identify and distinguish between reflectional and rotational symmetry in a plane figure			

Logical Argument and Constructions Standards

	Standard Addressed			
4a	distinguish between undefined terms, definitions, postulates, conjectures, and theorems			
4b	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			
4c	verify that a conjecture is false using a counterexample			
4d	compare geometric relationships between Euclidean and spherical geometries, including parallel lines and the sum of the angles in a triangle			
5a	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			
5b	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			
5c	use the constructions of congruent segments, congruent angles, angle bisectors, and perpendicular bisectors to make conjectures about geometric relationships			
5d	verify the Triangle Inequality theorem using constructions and apply the theorem to solve problems			

Proof and Congruence Standards

	Standard Addressed			
6a	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			
6b	prove two triangles are congruent by applying the Side-Angle-Side, Angle-Side-Angle, Side-Side-Side, Angle-Angle-Side, and Hypotenuse-Leg congruence conditions			
6c	apply the definition of congruence, in terms of rigid transformations, to identify congruent figures and their corresponding sides and angles			
6d	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			
6e	prove a quadrilateral is a parallelogram, rectangle, square, or rhombus using opposite sides, opposite angles, or diagonals and apply these relationships to solve problems			

Similarity, Proof and Trigonometry Standards

	Standard Addressed			
7a	apply the definition of similarity in terms of a dilation to identify similar figures and their proportional sides and the congruent corresponding angles			
7b	apply the Angle-Angle criterion to verify similar triangles and apply the proportionality of the corresponding sides to solve problems			
8a	prove theorems about similar triangles, including the Triangle Proportionality theorem, and apply these theorems to solve problems			
8b	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			
9a	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			
9b	apply the relationships in special right triangles 30° - 60° - 90° and 45° - 45° - 90° and the Pythagorean theorem, including Pythagorean triples, to solve problems			

Two-Dimensional and Three-Dimensional Figures Standards

	Standard Addressed			
10a	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			
10b	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 change			
11a	apply the formula for the area of regular polygons to solve problems using appropriate units of measure			
11b	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			
11c	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			
11d	apply the formulas for the volume of three-dimensional figures, including prisms, pyramids, cones, cylinders, spheres, and composite figures, to solve problems using appropriate units of measure			

Circles Standards

	Standard Addressed			
I2a	apply theorems about circles, including relationships among angles, radii, chords, tangents, and secants, to solve non-contextual problems			
I2b	apply the proportional relationship between the measure of an arc length of a circle and the circumference of the circle to solve problems			
I2c	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			
I2d	describe 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			
I2e	show that the equation of a circle with center at the origin and radius r is $x^2 + y^2 = r^2$ and determine the equation for the graph of a circle with radius r and center (h, k) , $(x - h)^2 + (y - k)^2 = r^2$			

Probability Standards

	Standard Addressed			
13a	develop strategies to use permutations and combinations to solve contextual problems			
13b	determine probabilities based on area to solve contextual problems			
13c	identify whether two events are independent and compute the probability of the two events occurring together with or without replacement			
13d	apply conditional probability in contextual problems			
13e	apply independence in contextual problems			

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