

Catoosa County Public Schools

Teaching and Learning Standards

Every Child, Every Day, Without Exception



Algebra I

District Essential Standards and Learning Targets

2.5 Analyze the difference between linear functions and nonlinear functions by informally analyzing the graphs of various parent functions (linear, quadratic, exponential, absolute value, square root, and cube root parent curves).

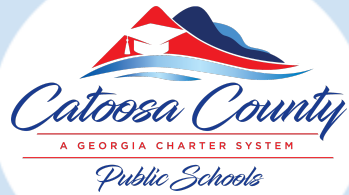
- I can analyze the differences between linear functions and nonlinear functions.
- I can identify and distinguish between graphs of various parent functions (linear, quadratic, exponential, absolute value, square root, and cube root).

7.2 Identify the effect on the graph generated by a quadratic function when replacing $f(x)$ with $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs.

- I can identify the vertex of a quadratic function.
- I can identify the transformation of a quadratic function given an equation or a graph.
- I can use transformations to create functions in vertex form given a graph.

7.3 Graph and analyze the key characteristics of quadratic functions.

- I can graph quadratic functions by hand and with technology (**include standard, vertex and intercept/factored form).
- I can identify the key characteristics of quadratic functions. (vertex, x and y intercepts, domain and range, increasing and decreasing intervals, positive and negative intervals, maximum and minimum values, and end behavior).



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7.4 Relate the domain and range of a quadratic function to its graph and, where applicable, to the quantitative relationship it describes.

- I can identify appropriate domains and ranges given context.
- I can identify specific heights or times using the function $h(t)$.

7.7 Estimate, calculate, and interpret the average rate of change of a quadratic function and make comparisons to the average rate of change of linear functions.

- I can use the graphs of linear and quadratic functions to estimate the rate of change (slope).
- I can calculate rates of change given graphs, tables, and ordered pairs of linear and quadratic functions.
- I can compare rates of change using algebraic methods and differences from tables over equal intervals.

9.2 Graph and analyze the key characteristics of simple exponential functions based on mathematically applicable situations.

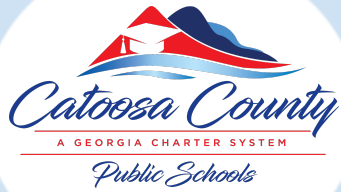
- I can graph exponential functions using the key features by hand and using technology (Domain, range, intercepts, average rate of change, intervals of increase and decrease, asymptotes and end behavior).
- I can find the appropriate domain of exponential functions in context.
- I can compare linear and exponential functions by calculating their average rate of change.
- I can express key features in interval notation and set-builder notation using inequalities.

3.2 Apply the distance formula, midpoint formula, and slope of line segments to solve real-world problems.

- I can apply the distance formula to solve real world problems.
- I can use/calculate the slope of line segments to solve real world problems.
- I can apply the midpoint formula to solve real world problems.

4.3 Solve systems of linear inequalities by graphing, including systems representing a mathematically applicable situation.

- I can solve a system of linear inequalities in two variables by graphing.
- I can create a system of linear inequalities from a real-world situation.



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6.1 Interpret quadratic expressions and parts of a quadratic expression that represent a quantity in terms of its context.

- I can identify parts of a quadratic expression, such as terms, factors, leading coefficient, coefficient, constant, and degree.
- I can interpret parts of a quadratic expression in context.

6.3 Create and solve quadratic equations in one variable and explain the solution in the framework of applicable phenomena.

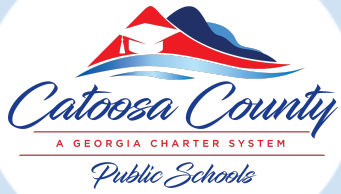
- I can add and subtract polynomial expressions. (fundamental skill)
- I can multiply polynomial expressions using various strategies. (fundamental skill)
- I can identify and convert fluently between a quadratic equation in standard, vertex, or factored form.
- I can solve a quadratic equation by square roots, factoring, quadratic formula, and completing the square (*if you are not a resource teacher).
- I can create quadratic equations in one variable, given a scenario.

8.3 Create exponential equations in two variables to represent relationships between quantities, including in mathematically applicable situations; graph equations on coordinate axes with labels and scales.

- I can graph exponential equations with appropriate scales.
- I can create equations of exponential functions given tables, graphs, and real world scenarios.
- I can apply exponential equations through growth and decay situations.

5.1 Rewrite algebraic and numeric expressions involving radicals.

- I can identify rational and irrational numbers.
- I can simplify radicals (square and cube roots)
- I can add and subtract radical expressions.
- I can multiply radical expressions.
- I can recognize when sums and products of numbers are rational or irrational.



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10.8 Use statistics appropriate to the shape of the data distribution to compare and represent center (median and mean) and variability (interquartile range, standard deviation) of two or more distributions by hand and using technology.

- I can compare the measures of center and spread/variability.