

Algebra 1 – Unit 7: Quadratic and Exponential Functions

Expectations, Essential Questions, Enduring Understandings, Indicators and Vocabulary

Expectations

- 1.1 analyze a wide variety of patterns and functional relationships using the language of mathematics and appropriate technology.
- 1.2 model and interpret real-world situations using the language of mathematics and appropriate technology.
- 3.2 apply the basic concepts of statistics and probability to predict possible outcomes of real-world situations, using technology as needed.

Essential Questions

How do quadratic functions model real-world problems and their solutions?

How do linear and non-linear functions compare?

Enduring Understandings

Non-linear functions have non-constant rates of change.

The characteristics of non-linear functions and their representations are useful in solving real-world problems.

Indicators

- 1.1.1.3 recognize and describe quadratic functions that are expressed numerically, algebraically, and/or graphically.
- 1.1.2.5 describe the effect of a change in the parameters a , h , and k on the graph of $f(x) = a(x - h)^2 + k$.
- 1.1.2.6 represent quadratic functions numerically, algebraically, and/or graphically
- 1.1.4.1 identify the properties of a quadratic function.
- 1.1.4.3 solve a quadratic equation using a graph, factors, or the quadratic formula.
- 1.2.4.3 solve a real-world problem involving a quadratic function.
- 1.1.4 describe the graph of a non-linear function and discuss its appearance in terms of the basic concepts of maxima and minima, zeros (roots), rate of change, domain and range, and continuity.
- 3.2.2 interpret data and/or make predictions by finding and using a line of best fit and by using a given curve of best fit.

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Vocabulary

asymptote
axis of symmetry
compound interest
discriminant
exponential decay
exponential function
exponential growth
inverse variation
limit
linear term
maximum value of a function
minimum value of a function
parabola
quadratic equation
quadratic function
quadratic term
roots of an equation
vertex
zeros of a function