West Virginia Content Standard for Maximizing Area of Rectangular Gardens

Standard 2: Students will:

- **demonstrate understanding of patterns, relations, and functions;**
- **represent and analyze mathematical situations and structures using algebraic symbols;**
- **uses mathematical models to represent and understand quantitative relationships; and**
- **analyze change in various contexts through communication, representation reasoning and proof, problem solving, and making connections within and beyond the field of mathematics.**

West Virginia Content Objectives for Maximizing Area of Rectangular Gardens

A1.2.5 analyze a given set of data for the existence of a pattern numerically algebraically and graphically; determine the domain and range; and determine if the relation is a function.

A1.2.16 solve quadratic equations by graphing, factoring and quadratic formula.

A1.2.18 collect, organize, interpret data and predict outcomes using the mean, mode, median and range.

A2.2.8 solve equations containing radicals and **exponents**.

A2.2.9 define a function; find the domain, range, zeros; find the inverse of a function; **find the value of a function for a given element in its domain**; and perform basic operations on functions including composition of functions.

A2.2.10 explore families of functions: **recognize** linear, **quadratic**, absolute value, step, and exponential **functions; and convert among graphs, tables, and equations**.

A2.2.17 perform a quadratic regression and use the results to predict specific values of a variable. Identify the regression equation.

PC.2.1 investigate and sketch the graphs of polynomials and rational functions **using the characteristics of zeros**, upper and lower bounds, **y-intercepts, symmetry,** asymptotes and end behavior, **maximum and minimum points and domain and range.**

West Virginia Performance Descriptors for Maximizing Area of Rectangular Gardens

- **Distinguished**

The student demonstrates exceptional and exemplary performance with distinctive and sophisticated application of knowledge and skills that exceeds the standard in Algebra II. The student develops equations to solve practical application problems giving solutions in a clear, concise manner. The student finds domain, range and zeros of functions converting forms among graphs, tables and equations. The student solves quadratic equations over the set of complex numbers using various techniques confirming solutions both numerically and graphically in a clear concise manner and performs quadratic regressions using the regression equation to predict values.

- **Above Mastery**

The student demonstrates competent and proficient performance and shows a thorough and effective application of knowledge and skills that exceeds the standard in Algebra II. The student finds domain, range and zeros of quadratic functions using graphs, tables and equations. The student solves quadratic equations over the set of complex numbers using various techniques, confirming solutions either numerically or graphically and performs quadratic regressions giving the regression equation.

- **Mastery**

The student demonstrates fundamental course or grade level knowledge and skills by showing consistent and accurate academic performance that meets the standard in Algebra II. The student finds domain, range and zeros of basic quadratic functions using graphs, tables and equations. The student solves quadratic equations over the set of complex numbers confirming solutions numerically or graphically.

- **Partial Mastery**

The student demonstrates basic but inconsistent performance of fundamental knowledge and skills characterized by errors and/or omissions in Algebra II. Performance needs further development. The student inconsistently finds the domain, range and zeros of simple quadratic functions and attempts to solve simple quadratic equations given a graph.

- **Novice**

The student demonstrates substantial need for the development of fundamental knowledge and skills, characterized by fragmented and incomplete performance in Algebra II. Performance needs considerable development. The student graphs parabolas given a table and attempts to solve simple quadratic equations.