

Unit Title: “The Amusement Park: Factoring Quadratics”

Course: Algebra I (High School)

Subject Area: Mathematics

Time Frame: 13 days

Standards

Algebra I Standards	Sunshine State Standards Benchmarks	NCEE New Standards
<p>The student will:</p> <p>6.3 Multiply polynomials.</p> <p>6.4 Factor integers and find the greatest common factor for sets of integers.</p> <p>6.5 Find the monomial factors of given polynomials.</p> <p>6.8 Factor the differences of squares, trinomial squares, and trinomials which are not perfect squares.</p> <p>6.9 Factor by grouping.</p> <p>6.10 Solve equations by factoring.</p> <p>7.7 Graph equations of the form $y = ax^2 + bx + c$, where a, b, c, are real numbers.</p>	<p>MA.A.3.4.1 The student will understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.</p> <p>MA.A.3.4.2 The student will select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.</p> <p>MA.A.3.4.3 The student will add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics,</p>	<p>The student:</p> <p>M3a Discovers, describes, and generalizes patterns, including linear, exponential, and simple quadratic relationships, i.e., those of the form $f(n) = n^2$ or $f(n) = cn^2$, for constant c, including $A = \pi r^2$, and represents them with variables and expressions.</p> <p>M3b Represents relationships with tables, graphs in the coordinate plane, and verbal or symbolic rules.</p> <p>M3c Analyzes tables, graphs, and rules to determine functional relationships.</p> <p>M3d Finds solutions for unknown quantities in linear equations and in simple equations and inequalities.</p>

	<p>paper and pencil, and calculator.</p> <p>MA.D.2.4.2 The student will use systems of equations and inequalities to solve real-world problems graphically, algebraically, <i>and with matrices</i>.</p>	
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Desired Results

Enduring Understanding	Essential Questions	Knowledge and Skills
<p>Students will understand:</p> <ul style="list-style-type: none"> The goal of algebra instruction is interpreting and writing symbolic expressions while focusing on non-symbolic representations such as graphs and tables. 	<ul style="list-style-type: none"> What rules govern the way expressions are evaluated? Is there more than one way to evaluate an expression? How can I tell if two expressions are equivalent? Which form of an expression should I use? What additional information does an equivalent form of an expression reveal? What properties of real numbers are useful to help confirm that two or more expressions are equivalent? How can the distributive property be applied to solve problems? What properties of real numbers are needed to solve linear and quadratic equations? 	<p>Students will know</p> <ul style="list-style-type: none"> Key terms (i.e., algebraic expression, distributive property, equivalent expressions, factored form, functions, roots, term). <p>Students will be able to</p> <ul style="list-style-type: none"> Multiply polynomials. Factor integers and find the greatest common factor for sets of integers. Find the monomial factors of given polynomials. Factor the differences of squares, trinomial squares, and trinomials which are not perfect squares. Factor by grouping. Solve equations by factoring. Graph equations of the form $y = ax^2 + bx + c$, where a, b, c, are real numbers.

Acceptable Evidence

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
<ul style="list-style-type: none"> Master Plan for Amusement Park Student use master plan for the city amusement park and finding area as a foundation for multiplication of polynomials and factoring polynomials. The “diamond problems” are integrated into the area model for facilitating the use of the 	<p>Check-Up 1 Quiz A Check-Up 2 Quiz B Unit Test</p>	<p>Teacher observations of students during work on performance tasks. Accountable talk during work on performance tasks.</p>

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
<p>distributive property.</p> <ul style="list-style-type: none"> • The Zero Product Property Students are introduced to the Zero Product Property as a way to solve quadratic equations. The focus is on the graphical interpretation. • Amusement Park Problem The purpose of the problem is to revisit factoring as finding the dimensions of a rectangle. Students will apply their problem solving skills to rearrange the area as the plans for the Amusement Park change. 		