

Quadratic Functions

Solve quadratic equations (10.1)

CCSS	4 – Mastery	3 – Proficient	2 - Basic	1 – Below Basic	0 – No Evidence
Solve quadratic equations (A.REI.4)	<p>Can extend thinking beyond the standard, including tasks that may involve one of the following:</p> <ul style="list-style-type: none"> • Designing • Connecting • Synthesizing 	<p>Solve quadratic equations using all of the following methods</p> <ul style="list-style-type: none"> • inspection • taking square roots, • completing the square, • the quadratic formula • factoring 	<p>Solve quadratic equations by using three of the following methods:</p> <ul style="list-style-type: none"> • inspection • taking square roots • completing the square • the quadratic formula • factoring 	<p>Solve quadratic equations by using two of the following methods:</p> <ul style="list-style-type: none"> • inspection • taking square roots • completing the square • the quadratic formula • factoring 	<p>Little evidence of reasoning or application to solve the problem</p> <p>Does not meet the criteria in a level 1</p>
Explain rational and irrational operations (N.RN.3)	<ul style="list-style-type: none"> • Applying • Justifying • Critiquing • Analyzing • Creating • Proving 	<p>Justify all of the following:</p> <ul style="list-style-type: none"> • when adding or multiplying two rational numbers the result is a rational number. • when adding a rational number and an irrational number the result is irrational. • multiplying a nonzero rational number and an irrational number the result is irrational. 	<p>Justify two of the following:</p> <ul style="list-style-type: none"> • when adding or multiplying two rational numbers the result is a rational number. • when adding a rational number and an irrational number the result is irrational. • multiplying a nonzero rational number and an irrational number the result is irrational. 	<p>justify one of the following:</p> <ul style="list-style-type: none"> • when adding or multiplying two rational numbers the result is a rational number. • when adding a rational number and an irrational number the result is irrational. • multiplying a nonzero rational number and an irrational number the result is irrational. 	

A.REI.4 Solve quadratic equations in one variable.

a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b .

N.RN.3 Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

Quadratic Functions

Analyze quadratic functions (10.2)

CCSS	4 – Mastery	3 – Proficient	2 - Basic	1 – Below Basic	0 – No Evidence
Identify key features of quadratic functions (F.IF.8, A.SSE.3)	Can extend thinking beyond the standard, including tasks that may involve one of the following: <ul style="list-style-type: none"> • Designing • Connecting • Synthesizing • Applying • Justifying • Critiquing • Analyzing • Creating • Proving 	Use factoring and completing the square in a quadratic function to determine all of the following <ul style="list-style-type: none"> • the vertex • axis of symmetry, • direction of opening, • zeros/roots in context of the situation	<u>Use factoring and completing the square</u> in a quadratic function to determine 2 of the following <ul style="list-style-type: none"> • the vertex • axis of symmetry, • direction of opening, • zeros/roots <u>in context of the situation</u>	<u>Given a quadratic function</u> in <ul style="list-style-type: none"> • vertex form find the vertex; • factored form find the zeros/roots; • standard form find the direction of opening 	Little evidence of reasoning or application to solve the problem Does not meet the criteria in a level 1

F.IF.8 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
 a. Use the process of factoring and completing the square in a quadratic functions to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

A.SSE.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.*
 a. Factor a quadratic expression to reveal the zeros of the function it defines.
 b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.