

Algebra I PBA/MYA

Evidence Statement Key	Evidence Statement Text	Clarifications	MP	Calculator
A-SSE.2-1	Use the structure of numerical expressions and polynomial expressions in one variable to identify ways to rewrite it.	i) Examples: Recognize $53^2 - 47^2$ as a difference of squares and see an opportunity to rewrite it in the easier to evaluate form $(53 + 47)(53 - 47)$. See an opportunity to rewrite $a^2 + 9a + 14$ as $(a + 7)(a + 2)$.	7	Neutral
A-SSE.3a	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.	None	7	Neutral
A-APR.1-1	Add, subtract, and multiply polynomials.	i) The “understand” part of the standard is not assessed here; it is assessed under Sub-claim C.	-	Neutral
A-CED.4-1	Rearrange linear formulas to highlight a quantity of interest, using the same reasoning as in solving equations. <i>For example, rearrange Ohm’s law $V = IR$ to highlight resistance R.</i>	i) Tasks have a context.	2, 6, 7	Neutral
A-REI.4b-1	Solve quadratic equations in one variable. b) Solve quadratic equations with rational number coefficients 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.	i) Tasks should exhibit variety in initial forms. Examples of quadratic equations with real solutions: $t^2 = 49$, $3a^2 = 4$, $7 = x^2$, $r^2 = 0$, $\frac{1}{2}y^2 = \frac{1}{5}$, $y^2 - 8y + 15 = 0$, $2x^2 - 16x + 30 = 0$, $2p = p^2 + 1$, $t^2 = 4t$, $7x^2 + 5x - 3 = 0$, $\frac{3}{4}c(c - 1) = c$, $(3x - 2)^2 = 6x - 4$ ii) Methods are not explicitly assessed; strategy is assessed indirectly by presenting students with a variety of initial forms. iii) For rational solutions, exact values are required. For irrational solutions, exact or decimal approximations may be required. Simplifying or rewriting radicals is not required. iv) Prompts integrate mathematical practices by not indicating that the equation is quadratic. (E.g., “Find all real solutions of the equation $t^2 = 4t$ ”...not, “Solve the quadratic equation $t^2 = 4t$.”)	7, 5	Item Specific

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A-REI.4b-2	Solve quadratic equations in one variable. b) Recognize when the quadratic formula gives complex solutions.	i) Tasks involve recognizing an equation with complex solutions, e.g., “Which of the following equations has no real solutions?” with one of the options being a quadratic equation with non-real solutions. ii) Writing solutions in the form $a \pm bi$ is not assessed here. (N-CN.7 is assessed in Algebra 2)	7, 5	Neutral
A-REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	None	7	Item Specific
A-REI.11-1a	Find the solutions of where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect, e.g. using technology to graph the functions, make tables of values or find successive approximations. Limit $f(x)$ and/or $g(x)$ to linear and quadratic functions.★	i) The “explain” part of standard A.REI.11 is not assessed here. For this aspect of the standard, see Sub-claim C.	1, 5	Item Specific
A-REI.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	None	1, 5, 6	No
F-IF.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$.	None	2	Neutral
F-IF.6-1a	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval with functions limited to linear, exponential and quadratic functions.★	i) Tasks have a context.	1, 4, 5, 7	Item Specific

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(<http://www.corestandards.org/Math/Content/HSM>)

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F-IF.6-6a	Estimate the rate of change from a graph utilizing linear functions and quadratic functions.★	i) Tasks have a context.	1, 4, 5, 7	Item Specific
F-IF.7a-1	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ a) Graph linear functions and show intercepts.	None	1, 5, 6	Item Specific
F-IF.7a-2	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★ a) Graph quadratic functions and show intercepts, maxima, and minima.	None	1, 5, 6	Item Specific
HS.C.2.1	Base explanations/reasoning on the properties of rational and irrational numbers. Content Scope: N-RN.3	For rational solutions, exact values are required. For irrational solutions, exact or decimal approximations may be required. Simplifying or rewriting radicals is not required.	3	Yes
HS.C.5.5	Given an equation or system of equations, reason about the number or nature of the solutions. Content Scope: A-REI.4a and A-REI.4b, limited to real solutions only.	None	3	Yes
HS.C.5.6	Given an equation or system of equations, reason about the number or nature of the solutions. Content Scope: A.REI.5	None	3	Yes
HS.C.5.10-1	Given an equation or system of equations, reason about the number or nature of the solutions. Content Scope: A-REI.11 limited to equations of the form $f(x) = g(x)$ where f and g are linear or quadratic.	None	3	Yes
HS.C.6.1	Base explanations/reasoning on the principle that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane. Content Scope: A-REI.D excluding exponential and logarithmic functions.	None	3	Yes
HS.C.8.1	Construct, autonomously, chains of reasoning that will justify or refute algebraic propositions or conjectures. Content Scope: A-APR.1	None	3	Yes

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HS.C.9.1	Express reasoning about transformations of functions. Content Scope: F.BF.3, limited to linear and quadratic functions. Tasks will not involve ideas of even or odd functions.	None	3	Yes
HS.C.10.1	Express reasoning about linear and exponential growth. Content scope: F-LE.1a	None	3	Yes
HS.C.12.1	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures about functions. Content scope: F-IF.8a	<p>i) Tasks involve using algebra to prove properties of given functions. For example, prove algebraically that the function $h(t) = t(t-1)$ has minimum value $1/4$; prove algebraically that the graph of $g(x) = x^2 - x + \frac{1}{4}$ is symmetric about the line $x = \frac{1}{2}$; prove that $x^2 + 1$ is never less than $-2x$.</p> <p>ii) Scaffolding is provided to ensure tasks have appropriate level of difficulty. (For example, the prompt could show the graphs of $x^2 + 1$ and $-2x$ on the same set of axes, and say, "From the graph, it looks as if $x^2 + 1$ is never less than $-2x$. In this task you will use algebra to prove it." And so on, perhaps with additional hints or scaffolding.</p>	3	Yes
HS.C.16.2	Given an equation or system of equations, present the solution steps as a logical argument that concludes with the set of solutions (if any). Tasks are limited to quadratic equations. Content Scope: A-REI.1, A-REI.4a, A-REI.4b, limited to real solutions only	None	6	Yes
HS.C.18.1	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures about linear equations in one or two variables. Content scope: 8.EE.B	None	3, 6	Yes
HS.D.1-1	Solve multi-step contextual problems with degree of difficulty appropriate to the course, requiring application of knowledge and skills articulated in 7.RP.A, 7.NS.3, 7.EE, and/or 8.EE.	None	4, may involve 1, 2, 5, 7	Yes
HS.D.2-5	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in A-CED, N-Q, A-SSE.3, A-REI.6, A-REI.12, A-REI.11-2, limited to linear equations and exponential equations with integer exponents.	i) A-CED is the primary content; other listed content elements may be involved in tasks as well.	4, 2	Yes

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HS.D.2-6	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in A-CED, N-Q.2, A-SSE.3, A-REI.6, A-REI.12, A-REI.11-2, limited to linear and quadratic functions.	i) A-CED is the primary content; other listed content elements may be involved in tasks as well.	4, 2	Yes
HS.D.2-8	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-BF.1a, F-BF.3, A-CED.1, A-SSE.3, F-IF.B, F-IF.7, limited to linear functions and exponential functions with domains in the integers.	i) F-BF.1a is the primary content; other listed content elements may be involved in tasks as well.	4, 2	Yes
HS.D.2-9	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in F-BF.1a, F-BF.3, A-CED.1, A-SSE.3, F-IF.B, F-IF.7, limited to linear and quadratic functions.	i) F-BF.1a is the primary content; other listed content elements may be involved in tasks as well.	4, 2	Yes
HS.D.3-1	Micro-models: Autonomously apply a technique from pure mathematics to a real-world situation in which the technique yields valuable results even though it is obviously not applicable in a strict mathematical sense (e.g., profitably applying proportional relationships to a phenomenon that is obviously nonlinear or statistical in nature). Content Scope: Knowledge and skills articulated in A-APR.1-1, A-CED.4-1, A-REI.10, A-REI-11.1a, A-REI.12, A-REI.4b-1, A-REI.4b-2, A-SSE.2-1, A-SSE.3a, F-IF.1, F-IF.6-1a, F-IF.6-6a, F-IF.7a-1, F-IF.7a-2, A-REI, A-APR, N-RN, F-BF, F-LE, F-IF.	None	4, may involve 1, 2, 5, 7	Yes
HS.D.3-3	Reasoned estimates: Use reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity. Content Scope: Knowledge and skills articulated in A-APR.1-1, A-CED.4-1, A-REI.10, A-REI-11.1a, A-REI.12, A-REI.4b-1, A-REI.4b-2, A-SSE.2-1, A-SSE.3a, F-IF.1, F-IF.6-1a, F-IF.6-6a, F-IF.7a-1, F-IF.7a-2, A-REI, A-APR, N-RN, F-BF, F-LE, F-IF.	None	4, may involve 1, 2, 5, 7	Yes