Depth of Knowledge Matrix – Algebra 1 (Integrated 1)

Topic	Solving Equations with Variables on Both Sides	Factoring Quadratics	Quadratics in Vertex Form	Adding polynomials
CCSS Stand.	• A-REI.3	• A-SSE.3a	• F-IF.7a	• A-APR.1
DOK 1 Example	Solve for *x*. $3x + 2 = -2x + 4$	Find the factors: $2x^2 + 7x + 3$	Find the roots and maximum of the quadratic equation below. $y = -3(x-4)^2 - 3$	Add the polynomials. $(4x^2 - 3x + 1) + (-6x^2 + 5x)$
DOK 2 Example	Using the digits 1 to 9 at most *two* times each, fill in the boxes to make an equation with no solutions. $\square x + \square = \square x + \square$	Find three different integers to put in the blank that will make the quadratic expression factorable. $x^2 + \_\_x + 4$	Create three equations for quadratics in vertex form that have roots at 3 and 5 but have different maximum and/or minimum values.	Using the integers −9 to 9 at most one time each, place an integer in each box to make two expressions: one that has three or more terms and one that has fewer than three terms. You may reuse all the integers for each expression. $(\square x^{\square} - \square x + \square) + (\square x^{\square} + \square x)$
DOK 3 Example	Using the digits 1 to 9 at most one time each, fill in the boxes so that the solution is closest to zero. $\square x + \square = \square x + \square$	Fill the blank by finding the largest and smallest integers that will make the quadratic expression factorable. $2x^2 + 3x + \_\_$	Using the digits 1 to 9 at most one time each, fill in the boxes to create a quadratic equation with the largest maximum value. $y = -\square(x-\square)^2 + \square$	Using the integers −9 to 9 at most one time each, place an integer in each box to make two expressions: one that has three or more terms and one that has fewer than three terms. You may reuse all the integers for each expression. $(\square x^{\square} - \square x + \square) + (\square x^{\square} + \square x)$

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Topic	Arithmetic Sequences	Systems of Equations	Systems of Inequalities	Properties of Exponents
CCSS Stand.	• F-BF.2	• A-REI.6	• A-REI.12	• N-RN.2
DOK 1 Example	Write a function that represents the arithmetic sequence below. $4, 0, -4, -8, -12, \ldots$	Find the solution to the system of equations. $4x + 3y = -5$ $y = -7x + 2$	Determine whether (2, 5) is a solution in the system of inequalities. $y < -4x + 2$ $y > 3x + -5$	Simplify. $(x^3)^4 \cdot x^{\frac{2}{7}}$
DOK 2 Example	Using the integers −9 to 9 at most one time each, place an integer in each box to create an arithmetic sequence and a function that represents it. $\square, \square, \square, \ldots$ $= \square x + \square$	Using the integers −9 to 9 at most one time each, place an integer in each box to create a system of equations and its solution. $\square x + \square y = \square$ $y = \square x + \square$ Solution: $(\square, \square)$	Using the integers −9 to 9 at most one time each, place an integer in each box to create a system of inequalities as well as an included and excluded point. $y < \square x + \square$ $y > \square x + \square$ Included: $(\square, \square)$ Excluded: $(\square, \square)$	Using the digits 1 to 9 at most one time each, fill in the boxes twice to make an equation. You may reuse all the digits for each expression. $(x^{\square})^{\square} \cdot x^{\frac{\square}{\square}} = x^{\square}$
DOK 3 Example	Using the integers −9 to 9 at most one time each, place an integer in each box to create an arithmetic sequence so that the coefficient in function that represents it is the greatest possible value. $\square, \square, \square, \ldots$ $= \square x + \square$	Using the integers −9 to 9 at most one time each, place an integer in each box to create a system of equations whose solution is as close to the origin as possible. $\square x + \square y = \square$ $y = \square x + \square$ Solution: $(\square, \square)$	Using the integers −9 to 9 at most one time each, place an integer in each box to create a system of inequalities as well as an included and excluded point. Make the points as close together as possible. $y < \square x + \square$ $y > \square x + \square$ Included: $(\square, \square)$ Excluded: $(\square, \square)$	Using the digits 1 to 9 at most one time each, fill in the boxes to make an equation where the product's exponent has the greatest possible value. $(x^{\square})^{\square} \cdot x^{\frac{\square}{\square}} = x^{\square}$