CCSS Advanced Algebra 3 AA Unit 1: Solving Equations Notes Name _____

I can SOLVE EQUATIONS by GRAPHING

To solve the equation $4^{x-2} + x = x^2 - 2x + 1$

GRAPHICALLY, you set up the functions:

y = $4^{x-2}+x$ and y = x^2-2x+1 in Desmos and find the x-coordinate of the point of intersection.

I can SOLVE QUADRATIC EQUATIONS by REVERSING OPERATIONS.

To solve the equation $4(x-5)^2 + 1 = 101$ by REVERSING OPERATIONS

1st: Subtract 1 to both sides of the equation.
$4(x-5)^2 = 100$

2nd: Divide 4 to both sides of the equation.
$(x-5)^2 = 25$

3rd: Square root to both sides of the equation.
$x-5 = 5$ or $x-5 = -5$

4th: Add 5 to both sides of the equation.

The solutions are x = 10 or x = 0

I can SOLVE QUADRATIC EQUATIONS by FACTORING and the ZERO PRODUCT PROPERTY.

To solve the equation $2x^2 - x - 3 = 0$. First convert to FACTORED FORM using

	$2x$	-3
x	$2x^2$	$3x$
$+1$	$2x$	-3

$(2x-3)(x+1) = 0$

Solve using the ZERO PRODUCT PROPERTY by setting $2x-3 = 0$ and $x+1 = 0$

The solutions are x = $3/2$ or x = -1.

I can WRITE QUADRATIC FUNCTIONS in GRAPHING FORM (including finding the dilation factor).

GRAPHING FORM: $y = a(x-h)^2 + k$

If the vertex of a parabola is (3, -5), replace the h with 3 and the K with -5.

To find the DILATION FACTOR (a), you take any other point on the parabola and Plug it in.

Then solve for a.

Example point (0, 13)

$13 = a(0-3)^2 - 5$

$13 = a(-3)^2 - 5$

$13 = a \cdot 9 - 5$

$+5 \quad +5$

$\frac{18}{9} = \frac{a \cdot 9}{9}$ → $2 = a$

$y = 2(x-3)^2 - 5$

I can WRITE QUADRATIC FUNCTIONS in FACTORED FORM (including finding the dilation factor).

FACTORED FORM: $y = a(x-p)(x-q)$

If the x-intercepts of a parabola are x = 2 and x = -8,

replace the p with 2 and the q with -8.

To find the DILATION FACTOR (a), you take any other point on the parabola and plug it in.

$y=a(x-2)(x--8)$

$y=a(x-2)(x+8)$

Then solve for a. Example point = (0, 4)

$4=a(0-2)(0+8)$

$4=a(-2)(8)$

$\frac{4}{-16}=\frac{a(-16)}{-16}$

$-\frac{1}{4}=a$

$y=-\frac{1}{4}(x-2)(x+8)$

I can SOLVE ABSOLUTE VALUE EQUATIONS by REVERSING OPERATIONS.

To solve the equation $-3|x-2|-7=-13$ by REVERSING OPERATIONS

1st: Add 7 to both sides of the equation.

$-3|x-2|=-6$

2nd: Divide -3 to both sides of the equation.

$|x-2|=2$

3rd: Set $x-2$ = 2 or -2.

$x-2=2$ $\quad$ $x-2=-2$

4th: Add 2 to both sides of the equation.

$x-2=2$ $\quad$ $x-2=-2$

$+2\ +2$ $\quad$ $+2\ +2$

The solutions are x = 4 or x = 0

I can SOLVE SQUARE ROOT EQUATIONS by REVERSING OPERATIONS.

To solve the equation $5\sqrt{x-10}+3=18$ by REVERSING OPERATIONS

$-3\ \ -3$

1st: Minus 3 to both sides of the equation.

$5\sqrt{x-10}=15$

2nd: Divide 5 to both sides of the equation.

$\sqrt{x-10}=3$

3rd: Square to both sides of the equation.

$x-10=9$

4th: Add 10 to both sides of the equation.

$x=19$

The solution is x = 19

I can SOLVE ONE-VARIABLE INEQUALITIES and represent the solutions on a NUMBER LINE and as an INEQUALITY.

To find the BOUNDARY POINT, rewrite the INEQUALITY as an Equation and solve for x.

To determine where the solutions are relative to the BOUNDARY POINT, choose a test POINT and check to see if it is a SOLUTION to the INEQUALITY.

If the test POINT is a SOLUTION, all SOLUTIONS to the INEQUALITY are in the same region(s) of the number line as the test POINT.

If the test POINT is NOT A SOLUTION, all SOLUTIONS to the INEQUALITY are in the opposite region(s) of the number line as the test POINT.