

keep scrolling to get a sneak peak!

This set of guided notes will walk Algebra 2 students through nonlinear systems of equations. All you need to do is print & make copies for your students!

NONLINEAR SYSTEMS OF EQUATIONS

Algebra 2 Guided Notes

NONLINEAR SYSTEMS OF EQUATIONS
Solutions for Linear-Quadratic Systems of Equations

Types of Solutions for Quadratic-Quadratic Systems

No Solution	1 Solution

Directions: Solve the system graphically.

$$x^2 + 5x - 1 = -x^2 + 2x + 1$$

EQ1: $x^2 + 5x - 1 = y$ 1-5-1
EQ2: $-x^2 + 2x + 1 = y$ 1+5-1

Solutions: $(-2, -7)$ & $(0.5, 1.75)$

Math with Ms. Rivera

ANSWER KEY INCLUDED

why do you need this?



It's simple and done-for-you! Just print and make copies!



Students can work on essential Algebra 2 skills.

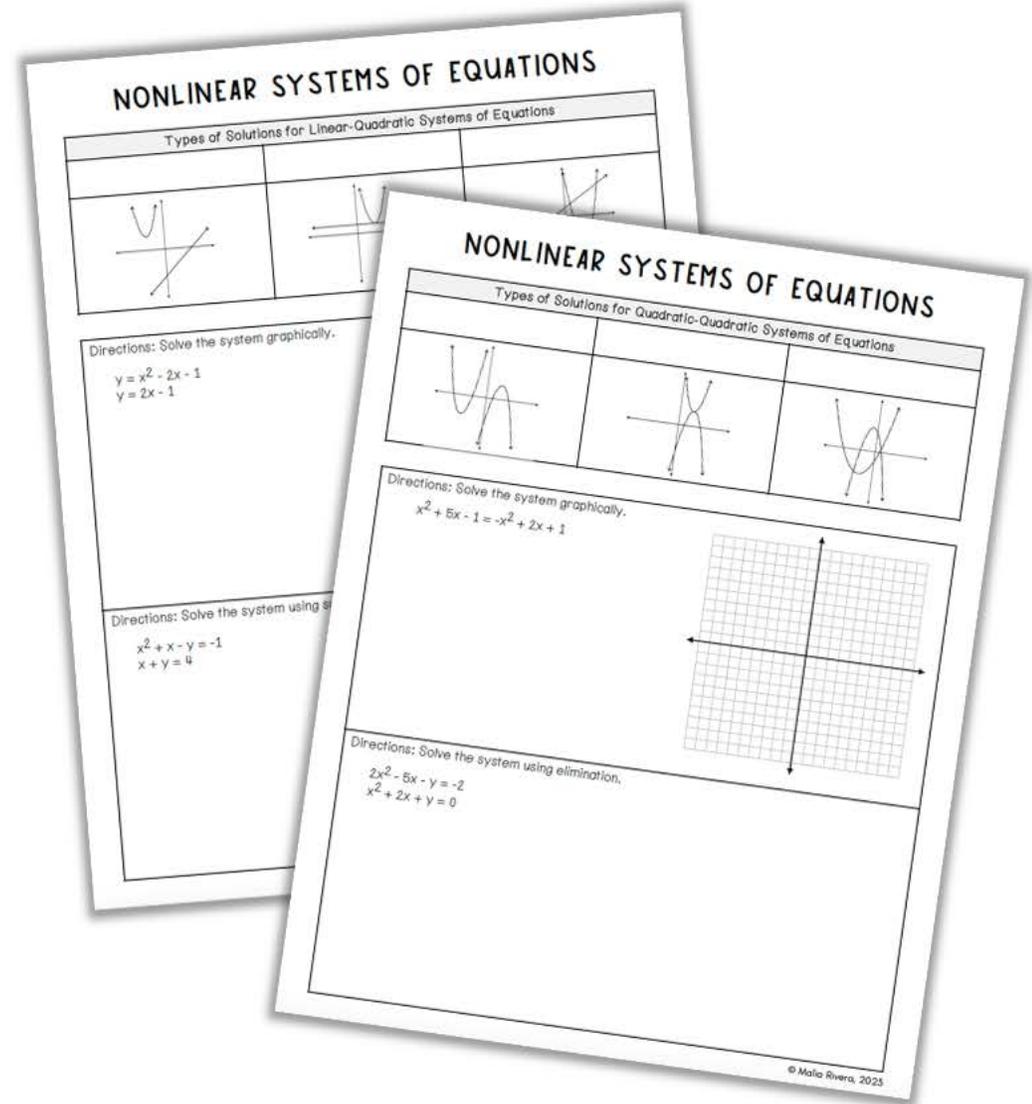


Aligns to CCSS, TEKS, and VA SOLs!

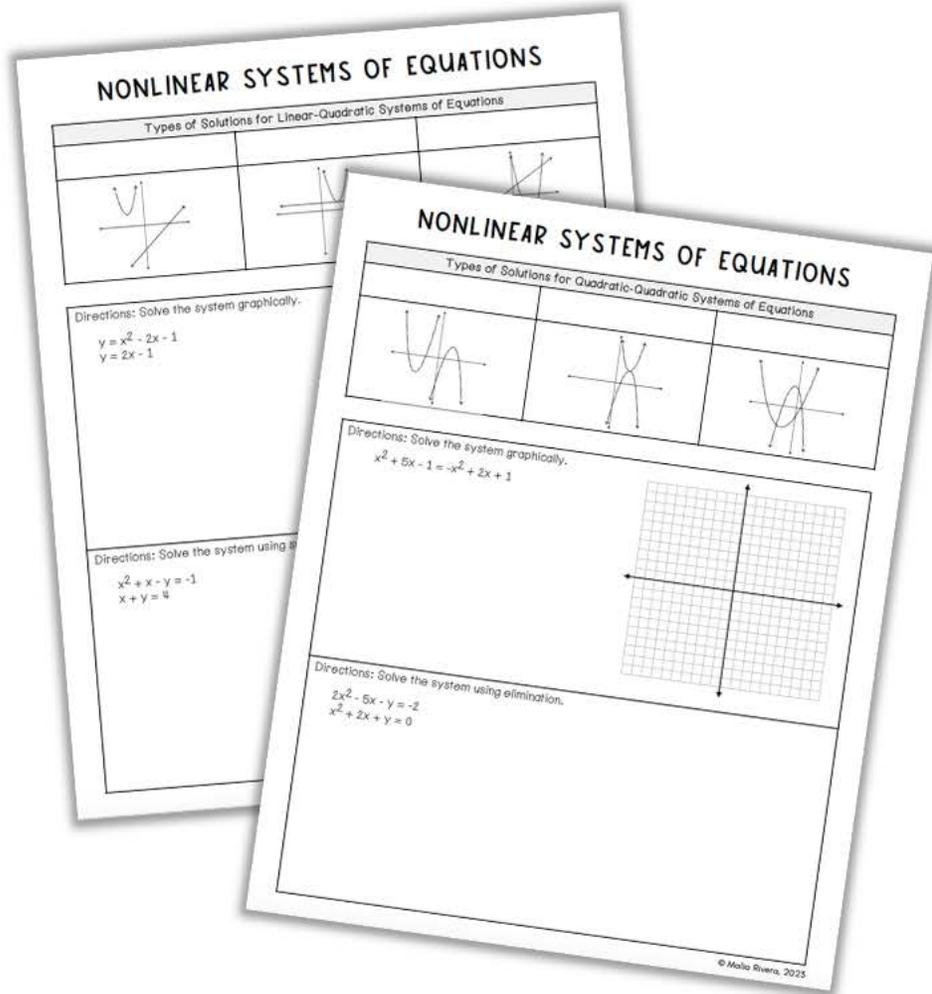


Suggested and detailed answer keys are included for you!

Algebra 2 Guided Notes Nonlinear Systems of Equations



Algebra 2 Guided Notes: Nonlinear Systems of Equations *includes:*



- ✓ 2 pages of guided notes
- ✓ Linear-Quadratic Graphically and Algebraically
- ✓ Quadratic-Quadratic Graphically and Algebraically
- ✓ Types of Solutions
- ✓ Solving by Substitution (Linear-Quad)
- ✓ Solving by Elimination (Quad-Quad)

Algebra 2 Guided Notes: Nonlinear Systems of Equations includes:

✓ Detailed answer keys

CCSS: HSA-REI.C.7, HSA-REI.D.10, HSA-REI.D.11

TEKs: A2.C.3

VA SOLs: EI.AII.4

The image shows two overlapping worksheets. The top worksheet is titled "NONLINEAR SYSTEMS OF EQUATIONS" and "Types of Solutions for Linear-Quadratic Systems of Equations". It has three columns: "NO SOLUTION" (a parabola and a line that do not intersect), "ONE SOLUTION" (a parabola and a line that are tangent to each other), and "TWO SOLUTIONS" (a parabola and a line that intersect at two points). Below this is a section "Directions: Solve the system graphically." with the system $y = x^2 - 2x - 1$ and $y = 2x - 1$. The solutions are given as $(0, -1)$ and $(4, 6)$. The bottom section "Directions: Solve the system using substitution" shows the system $x^2 + x - y = -1$ and $x + y = 4$. The substitution process is shown, leading to $y = -x + 4$ and then $x^2 + x - (-x + 4) = -1$, which simplifies to $x^2 + 2x - 3 = 0$. The solutions are $x = -3$ and $x = 1$, leading to $y = 7$ and $y = 5$ respectively. The solutions are $(-3, 7)$ and $(1, 5)$.

The bottom worksheet is titled "NONLINEAR SYSTEMS OF EQUATIONS" and "Types of Solutions for Quadratic-Quadratic Systems of Equations". It has three columns: "NO SOLUTION" (two parabolas that do not intersect), "1 SOLUTION" (two parabolas that are tangent to each other), and "2 SOLUTIONS" (two parabolas that intersect at two points). Below this is a section "Directions: Solve the system graphically." with the system $x^2 + 5x - 1 = -x^2 + 2x + 1$. The equations are labeled as EQ1: $x^2 + 5x - 1 = y$ and EQ2: $-x^2 + 2x + 1 = y$. The solutions are given as $(-2, -7)$ and $(0.5, 1.75)$. A note says "Check w/ your graphing calculator". A graph shows two parabolas intersecting at two points.

Check out what *other teachers* are saying:



"This was great practice for my Algebra II students after I presented the lesson. Next Year, I may use them as notes."

- Vonda B.



"Great resource for what we were currently covering in precalc!"

- Megan M.



"I used this in conjunction with another document, but this would have worked fine on its own. The students found it much easier to understand the concept using these guided notes."

- Cheryl W.

You may also enjoy ...

SOLVING QUADRATIC INEQUALITIES

Algebra 2 Guided Notes

Ways to write a quadratic inequality in one variable

$0 < ax^2 + bx + c$	$0 > ax^2 + bx + c$
$0 \leq ax^2 + bx + c$	$0 \geq ax^2 + bx + c$

Directions: Solve $x^2 - 3x - 4 < 0$.

Algebraically

$$ac = -4 \cdot -4 = 16$$
$$b = -3 \quad -4$$
$$x^2 - 3x - 4 = 0$$
$$(x^2 - 4x) + (x - 4) = 0$$
$$x(x - 4) + 1(x - 4) = 0$$
$$(x + 1)(x - 4) = 0$$

ZPP: $x + 1 = 0$ or $x - 4 = 0$

Answer key included

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QUADRATIC INEQUALITIES: GRAPHING & SYSTEMS

Algebra 2 Guided Notes

Ways to write a quadratic inequality in two variables

$y < ax^2 + bx + c$	$y > ax^2 + bx + c$
$y \leq ax^2 + bx + c$	$y \geq ax^2 + bx + c$

Steps for Graphing Quadratic Inequalities in Two Variables

Step 1: Graph $y = ax^2 + bx + c$ and make the line dashed based on the inequality symbol.

Step 2: Test a point to determine if it is a solution to the inequality.

Step 3: Shade the region that the point is in. If it is not a solution, shade the opposite region.

Directions: Graph the system of quadratic inequalities.

$$y < -x^2 + 3$$
$$y \geq x^2 + 2x - 3$$

Answer key included

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POLYNOMIAL OPERATIONS

Algebra 2 Guided Notes

Subtracting Polynomials

Directions: Subtract the polynomials together. Write your answer.

$$(2x^3 + 6x^2 - 4x + 1) - (x^3 - 10x^2 - x - 7)$$
$$= 2x^3 + 6x^2 - 4x + 1 - x^3 + 10x^2 + x + 7$$
$$= x^3 + 16x^2 - 3x + 8$$

Dividing Polynomials

Directions: Divide the polynomials together. Write your answer.

Example: Use synthetic division to evaluate $f(x) = 5x^2 - 3x + 2$ divided by $(x - 1)$.

Multiplying Polynomials

Directions: Multiply the polynomials. Write your answer.

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

Special Product Patterns:

Sum & Difference	$(a + b)(a - b) =$
Square of a Binomial	$(a + b)^2 =$
	$(a - b)^2 =$
Cube of a Binomial	$(a + b)^3 =$

Answer key included

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Check out the *year-long bundle!*

ALGEBRA 2 GUIDED NOTES Year-Long Bundle

TRANSFORMATIONS OF FUNCTIONS

Type of Transformation	$f(x)$ Notation
Reflection	$-f(x)$
Vertical Dilation	$af(x)$ $0 < a < 1$ $ a > 1$
Horizontal Dilation	$f(bx)$ $0 < b < 1$ $ b > 1$
Vertical Translation	$f(x) + k$

LINEAR REGRESSION

SCATTER PLOT
Definition: A graph of _____ points that are _____

SCATTER PLOT RELATIONSHIPS

LINE OF BEST FIT
Definition: A line that _____ as close as possible to all _____

LINEAR REGRESSION
Definition: A linear model that is used to _____ between two variables.

LINEAR INTERSECTIONS
Estimating data: _____
Clear: _____
Write: _____

GRAPHING QUADRATIC TRANSFORMS

Reflection over the x-axis: _____

COMPOSITION OF FUNCTIONS

Definition: To make the _____ another function.

Things to remember:

- Always start with the _____ the function on the _____
- Tag does not always equal _____

$(f \circ g)(x) = \dots$ is also _____

$g(x) = 2x + 3$ and $g(x) = x^2$, find $(f \circ g)(x)$

$g(x) = 2x + 3$ and $g(x) = x^2$, find $(g \circ f)(x)$

COMPOUND INEQUALITIES

A compound inequality has two separate inequalities joined by _____

The graph of the _____ is the _____

$x > 3$

POLYNOMIAL FUNCTION CHARACTERISTICS

Multiplicities	Touch	Inflection

RELATIVE EXTREMA (Minimum or Maximum)
Points on the graph that help to describe the _____ of a function. They are also called _____ or _____

INCREASING INTERVALS
The interval between _____ x -values _____ as the x -value _____

DECREASING INTERVALS
The interval between _____ x -values _____

POSITIVE INTERVALS
Intervals where _____

PROPERTIES OF RATIONAL EXPONENTS & RADICALS

Property	Properties of Rational Exponents
Product of Powers	Definition
Power of a Power	
Power of a Product	
Negative Exponent	
Zero Exponent	
Quotient of Powers	
Power of a Quotient	

Directions: Use the properties of rational exponents to simplify: $1. (y^{1/2} \cdot y^{1/3})^2$

Answer key included

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hey there!

My name is Malia and I'm passionate about making learning and practicing math fun. I love creating engaging math resources for my students and I hope your students enjoy these Nonlinear Systems of Equations guided notes for Algebra 2 that can be used all year long!

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