

keep scrolling to get a  
sneak peak!

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

# QUADRATIC REGRESSION

## Algebra 2 Guided Notes

**QUADRATIC REGRESSION**

Calculator Quadratic Regression

Step 1: Create a table of values. STAT > EDIT

Step 2: Run the quadratic regression. STAT > CALC > 5: QuadReg

Step 3: Write down the quadratic regression equation in  $y = ax^2 + bx + c$

The table below shows the fuel efficiencies of a vehicle at different speeds. Write a function that models the data. Use the model to approximate the optimal driving speed. Round to the nearest hundredths place, if necessary.

20	24	30	36	40	45	50	56	60
14.5	17.5	21.2	23.7	25.2	25.8	25.8	25.1	24.5

Quadratic Regression Model: \_\_\_\_\_

Write a function that models Gustavo's science project data. Write a function that models the data. Use the model to approximate the optimal driving speed. Round to the nearest hundredths place, if necessary.

3	4	5	6	7	8
37.3	37.9	36.4	32.7	32.4	29.1

**Math with Ms. Rivera**

**QUADRATIC REGRESSION**

Graphing Calculator Steps for Quadratic Regression

Step 1: Create a table of values. STAT > EDIT

Step 2: Run the quadratic regression. STAT > CALC > 5: QuadReg

Step 3: Write down the quadratic regression equation in  $y = ax^2 + bx + c$

1. The table below shows the fuel efficiencies of a vehicle at different speeds. Write a function that models the data. Use the model to approximate the optimal driving speed. Round to the nearest hundredths place, if necessary.

Miles per hour	20	24	30	36	40	45	50
Miles per gallon	14.5	17.5	21.2	23.7	25.2	25.8	25.8

Quadratic Regression Model:  $y = -0.01x^2 + 1.37x - 7.14$

2. The table below shows Gustavo's science project data. Write a function that models the data. Use the model to approximate the optimal driving speed. Round to the nearest hundredths place, if necessary.

Time	3	4	5	6	7	8
Speed (ft/sec)	37.3	37.9	36.4	32.7	32.4	29.1

**Answer key included**

© Malia Rivera, 2023

# 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 Quadratic Regression

**QUADRATIC REGRESSION**

Graphing Calculator Steps for Quadratic Regression	Step 1: Create a table of values. STAT > EDIT
	Step 2: Run the quadratic regression. STAT > CALC > 5: QuadReg
	Step 3: Write down the quadratic regression equation in $y = ax^2 + bx + c$

1. The table below shows the fuel efficiencies of a vehicle at different speeds. Write a function that models the data. Use the model to approximate the optimal driving speed. Round to the hundredths place, if necessary.

Miles per hour	20	24	30	36	40	45	50	56	60	70
Miles per gallon	14.5	17.5	21.2	23.7	25.2	25.8	25.8	25.1	24.0	19.5

Quadratic Regression Model: \_\_\_\_\_

2. The table below shows Gustavo's science project data. Write a function that models the data. Round to the nearest thousandths place, if necessary.

Time	1	2	3	4	5	6	7	8	9	10
Speed (ft/sec)	32.5	35.9	37.3	37.9	36.4	32.7	32.4	29.5	28.5	26.9

Quadratic Regression Model: \_\_\_\_\_

a) What is the axis of symmetry? \_\_\_\_\_

b) What is the vertex? \_\_\_\_\_

c) What is the approximate speed of the car at 7.2 seconds? \_\_\_\_\_

© Malia Rivera, 2023

# Algebra 2 Guided Notes: Quadratic Regression *includes:*

**QUADRATIC REGRESSION**

Graphing Calculator Steps for Quadratic Regression	Step 1: Create a table of values. STAT > EDIT
	Step 2: Run the quadratic regression. STAT > CALC > 5: QuadReg
	Step 3: Write down the quadratic regression equation in $y = ax^2 + bx + c$

1. The table below shows the fuel efficiencies of a vehicle at different speeds. Write a function that models the data. Use the model to approximate the optimal driving speed. Round to the hundredths place, if necessary.

Miles per hour	20	24	30	36	40	45	50	56	60	70
Miles per gallon	14.5	17.5	21.2	23.7	25.2	25.8	25.8	25.1	24.0	19.5

Quadratic Regression Model: \_\_\_\_\_

2. The table below shows Gustavo's science project data. Write a function that models the data. Round to the nearest thousandths place, if necessary.

Time	1	2	3	4	5	6	7	8	9	10
Speed (ft/sec)	32.5	35.9	37.3	37.9	36.4	32.7	32.4	29.5	28.5	26.9

Quadratic Regression Model: \_\_\_\_\_

a) What is the axis of symmetry? \_\_\_\_\_

b) What is the vertex? \_\_\_\_\_

c) What is the approximate speed of the car at 7.2 seconds? \_\_\_\_\_

© Malia Rivera, 2023

-  1 page of guided notes
-  Steps for how to perform quadratic regression in a graphing calculator
-  Interpret and analyze data

# Algebra 2 Guided Notes: Quadratic Regression includes:

✓ Detailed answer keys

**CCSS:** HSA-REI.D.10

**TEKS:** A2.8.B, A2.8.C

**VA SOLs:** S.AII.9

### QUADRATIC REGRESSION

**Graphing Calculator Steps for Quadratic Regression**

- Step 1: Create a table of values. STAT > EDIT
- Step 2: Run the quadratic regression. STAT > CALC > 5: QuadReg
- Step 3: Write down the quadratic regression equation in  $y = ax^2 + bx + c$

1. The table below shows the fuel efficiencies of a vehicle at different speeds. Write a function that models the data. Use the model to approximate the optimal driving speed. Round to the hundredths place, if necessary.

Miles per hour	20	24	30	36	40	45	50	56	60	70
Miles per gallon	14.5	17.5	21.2	23.7	25.2	25.8	25.8	25.1	24.0	19.5

Quadratic Regression Model:  $y = -0.01x^2 + 1.37x - 7.14$

2. The table below shows Gustavo's science project data. Write a function that models the data. Round to the nearest thousandths place, if necessary.

Time	1	2	3	4	5	6	7	8	9	10
Speed (ft/sec)	32.5	35.9	37.3	37.9	36.4	32.7	32.4	29.5	28.5	24.9

Quadratic Regression Model:  $y = -0.261x^2 + 1.893x + 32.638$

a) What is the axis of symmetry?  $x = 0.247$

b) What is the vertex?  $(0.247, 33.090)$

c) What is the approximate speed of the car at 7.2 seconds?  $32.737 \text{ ft/sec}$

© Malia Rivera, 2023

## 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 EQUATIONS BY GRAPHING

Algebra 2 Guided Notes

Directions: Solve the equation by graphing. Check with your graphing calculator.

1.  $x^2 + 2x + 3 = 0$

2.  $3x^2 = 6x - 3$

Solutions:  $X = -1, 3$

Solution(s):  $X = 1$

Math with Ms. Rivera

Answer key included

© Malia Rivera, 2023

## SOLVING QUADRATIC EQUATIONS BY SQUARE ROOTS

Algebra 2 Guided Notes

Directions: Solve the equation using the square roots method.

1.  $(x-4)^2 = 49$

$x-4 = \pm 7$

$x = 4+7 \quad x = 4-7$

$X = 11 \quad X = -3$

2.  $(x+13)^2 = -13$

$x+13 = \pm \sqrt{-13}$

$x = -13 \pm \sqrt{-13}$

$X = 0$

Math with Ms. Rivera

Answer key included

© Malia Rivera, 2023

## SOLVING QUADRATIC EQUATIONS BY FACTORING

Algebra 2 Guided Notes

Directions: Solve the quadratic equation by factoring.

1.  $x^2 - 9x + 45 = 0$

$(x-5)(x-9) = 0$

$x = 5 \quad x = 9$

2.  $-4x^2 - 30 = 34x$

$-4x^2 - 34x - 30 = 0$

$(-2x-5)(2x+6) = 0$

$x = -2.5 \quad x = -3$

Math with Ms. Rivera

Answer key included

© Malia Rivera, 2023

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 Slope: \_\_\_\_\_  
Slope: \_\_\_\_\_  
Y-intercept: \_\_\_\_\_

**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 \_\_\_\_\_

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

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

**COMPOUND INEQUALITIES**

Compound inequality has two separate inequalities joined by \_\_\_\_\_

Graph of a compound inequality with "and" is the \_\_\_\_\_ of the graphs of the inequalities.

$x > -8$

**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 \_\_\_\_\_ y-values as the x-value \_\_\_\_\_.

**DECREASING INTERVALS**  
The interval between \_\_\_\_\_ y-values as the x-value \_\_\_\_\_.

**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:  $1. (y^{1/2} \cdot y^{1/3})^2$

**Math with Ms. Rivera**

**ANSWER KEY INCLUDED**



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 Modeling Quadratic Regression guided notes for Algebra 2 that can be used all year long!

Did you know you could get **FREE** money from TPT??

All you need to do is leave feedback on the product after you purchase. [Click here](#) to leave reviews and earn credits towards your next TPT purchase!

let's connect!



Follow my TPT store



Follow my Instagram



Join my FB group