

keep scrolling to get a
sneak peak!

This set of guided
notes will walk Algebra
2 students through the
graphing polynomial
functions.
All you need to do is print
& make copies for your
students!

GRAPHING POLYNOMIAL FUNCTIONS

Algebra 2 Guided Notes

The image shows two overlapping pages of guided notes. The top page is titled "GRAPHING POLYNOMIAL FUNCTIONS" and contains the following text: "Graph of $f(x) = (x + 3)(x - 2)^2$ " and "The function is written in factored form". Below this is a coordinate plane with a red parabola opening downwards. The vertex is labeled $(0, 12)$. The x-axis has tick marks, and the y-axis has tick marks. A logo for "Math with Ms. Rivera" is in the bottom left corner. The bottom page is also titled "GRAPHING POLYNOMIAL FUNCTIONS" and contains the following text: "Sketch a graph of $f(x)$ that has the following characteristics: f has zeros $-2, 3,$ and 5 that do not repeat; f is increasing when $x < 0$ and $x > 4$; f is decreasing when $0 < x < 4$ ". To the right of this text are two lines: " $f(x) > 0$ when:" and " $f(x) < 0$ when:". Below this is a blank coordinate plane with x and y axes. At the bottom right of the page, it says "Degree:" and "Answer key included".

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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 Graphing Polynomial Functions

The image shows two overlapping worksheets titled "GRAPHING POLYNOMIAL FUNCTIONS".

The top worksheet (partially obscured) contains the following text:
Sketch a graph of $f(x)$ that has the following characteristics:
 f has zeros $-2, 3,$ and 5 that do not repeat
 f is increasing when $x < 0$ and $x > 4$
 f is decreasing when $0 < x < 4$
 $f(x) > 0$ when $-2 < x < 4$
 $f(x) < 0$ when $x < -2$ or $x > 4$

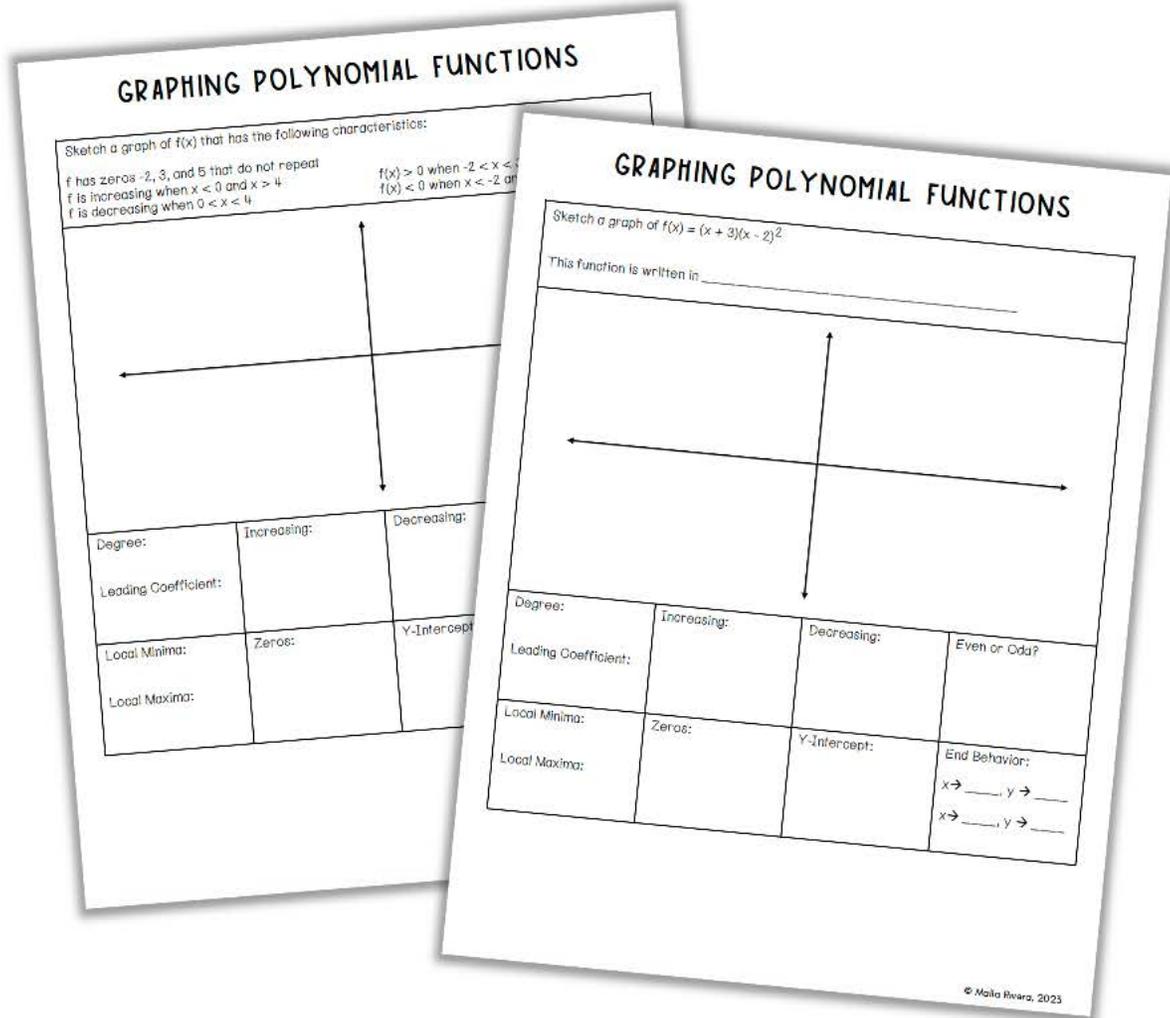
The bottom worksheet contains the following text:
Sketch a graph of $f(x) = (x + 3)(x - 2)^2$.
This function is written in _____

Both worksheets feature a coordinate plane for sketching the graph and a table for recording function characteristics.

Degree:	Increasing:	Decreasing:
Leading Coefficient:		
Local Minima:	Zeros:	Y-Intercept:
Local Maxima:		

Degree:	Increasing:	Decreasing:	Even or Odd?
Leading Coefficient:			
Local Minima:	Zeros:	Y-Intercept:	End Behavior: $x \rightarrow \dots, y \rightarrow \dots$ $x \rightarrow \dots, y \rightarrow \dots$
Local Maxima:			

Algebra 2 Guided Notes: Graphing Polynomial Functions *includes:*



- ✓ 2 pages of guided notes
- ✓ Sketching Polynomial Functions
- ✓ Given Characteristics
- ✓ Given a Polynomial Function in Factored Form
- ✓ Analyzing Key Characteristics

Algebra 2 Guided Notes: Graphing Polynomial Functions *includes:*

✓ Detailed answer keys

CCSS: HSA.APR.B.3, HSF.IF.B.4

TEKS: P.2.F, P.2.I, P.2.J

VA SOL: F.All.7bcdeh

GRAPHING POLYNOMIAL FUNCTIONS

Sketch a graph of $f(x)$ that has the following characteristics:

- f has zeros $-2, 3,$ and 5 that do not repeat
- f is increasing when $x < 0$ and $x > 4$
- f is decreasing when $0 < x < 4$

when $-2 < x < 3$ and $x > 5$
 $3 < x < 5$

GRAPHING POLYNOMIAL FUNCTIONS

Sketch a graph of $f(x) = (x + 3)(x - 2)^2$.

This function is written in factored form

Degree: 3	Increasing: $(-\infty, 0)$
Leading Coefficient: positive	
Local Minima: $(4, f(4))$	Zeros: $x =$
Local Maxima: $(0, 12)$	

Degree: 3	Increasing: (approximately)	Decreasing: (approximately)	Even or Odd?
Leading Coefficient:			

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 ...

WRITING POLYNOMIAL EQUATIONS

Algebra 2 Guided Notes

POLYNOMIAL EQUATIONS FROM GRAPH

Step 1: Identify the zeros and their factors

Step 2: Identify one more point on the graph

Step 3: Write out your polynomial in factored form

Step 4: Plug in the additional point to find your a-value

Step 5: Write it all out!

Write a polynomial function in factored form for the polynomial graphed below.

COMPLEX CONJUGATES

Complex Conjugates Theorem

If $a + bi$ is a root of the polynomial, then its complex conjugate, $a - bi$, is also a root.

Steps for writing polynomial questions with complex roots

Step 1: Identify the all real and complex roots.

Step 2: Write the polynomial in factored form.

Step 3: Multiply the factors together and simplify.

Directions: Write a polynomial function $f(x)$ of least degree that has leading coefficient of 1, and zeros: 2 and $3 + i$.

zeros: $x = -6 \rightarrow (x + 6)$
 $x = -1 \rightarrow (x + 1)$
point: $(-3, 3)$
 $f(x) = (x + 6)^2(x + 1)$

Answer key included

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MODELING POLYNOMIAL FUNCTIONS

Algebra 2 Guided Notes

MODELING POLYNOMIAL FUNCTIONS

Property of Finite Differences

If a polynomial function $y = f(x)$ has degree n , then the n th differences of the function values for equally-spaced x -values are constant.

Directions: Use finite differences to determine the degree of the data. Then use your graphing calculator to find the polynomial function.

x	1	2	3	4
y	1	4	10	20

MODELING POLYNOMIAL FUNCTIONS

Using Cubic Regression

Steps for Performing Cubic Regression with a Graphing Calculator

Step 1: STAT → EDIT → Enter

Step 2: Enter your data into the table

Step 3: STAT → CALC → 6: CubicReg

Step 4: Write your equation in the form: $y = ax^3 + bx^2 + cx + d$

Directions: The table below shows the total US biomass energy consumption in British thermal units, or Btus, in the year t , where $t = 1$ corresponds to the year 2000.

x	1	2	3	4	5	6	7	8
y	2622	2701	2807	3010	3117	3267	3493	3866

a) Write the equation of the cubic function that models the data.

b) Use the equation to predict the total US biomass energy consumption in the year 2010.

Answer key included

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SIMPLIFYING RADICAL EXPRESSIONS

Algebra 2 Guided Notes

SIMPLIFYING RADICAL EXPRESSIONS

$\sqrt[n]{a}$

The index will tell you how many factors are needed. Ex: 9^{th} root = 9 factors

- No radicals have perfect n th powers as factors other than 1.
- No radicals contain fractions.
- No radicals are in the denominator of fractions.

Write the radical in simplest form.

2. $\sqrt{16 \cdot 9}$
 $\sqrt{144}$
 12

3. $\sqrt{32 \cdot 5}$
 $\sqrt{160}$
 $4\sqrt{10}$

Find the number of factors of n .

Divide

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 Slope _____

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 _____

$(f \circ g)(x) = \dots$

$g(x) = 2x + 3$ 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

Compound inequality has two separate inequalities joined by _____

Graph of a compound inequality with "and" 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: $1. (y^{1/2} \cdot y^{1/3})^2$

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 Graphing Polynomial Functions guided notes for Algebra 2 that can be used all year long!

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