

algebra 2 parent functions

Algebra 2 Parent Functions: Unveiling the Building Blocks of Advanced Mathematics

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Abstract: This article delves into the crucial role of algebra 2 parent functions in understanding and mastering more complex mathematical concepts. We explore the defining characteristics of key parent functions, the transformations applied to them, and the challenges and opportunities presented to students learning these fundamental building blocks of advanced mathematics. We will also address common misconceptions and provide strategies for effective learning and teaching.

1. Introduction to Algebra 2 Parent Functions

Algebra 2 builds upon the foundation established in Algebra 1, introducing students to more intricate mathematical relationships and functions. At the heart of this advanced study lies the concept of algebra 2 parent functions. These are the simplest forms of various function families, serving as fundamental building blocks upon which more complex functions are constructed. Understanding these parent functions is crucial for grasping the behavior and characteristics of their transformations. Without a solid grasp of these core functions, students will struggle with higher-level mathematics, including calculus and beyond.

2. Key Algebra 2 Parent Functions and Their Characteristics

Several key parent functions are central to Algebra 2:

Linear Functions ($f(x) = x$): The simplest function, representing a straight line with a slope of 1 and a y-intercept of 0. Its characteristics include a constant rate of change and a domain and range of all real numbers.

Quadratic Functions ($f(x) = x^2$): This function represents a parabola, characterized by a U-shaped curve. Its key features include a vertex, axis of symmetry, and a domain of all real

numbers, but a range restricted to non-negative values for the basic function.

Cubic Functions ($f(x) = x^3$): A cubic function forms an S-shaped curve. It has a single inflection point and a domain and range of all real numbers.

Absolute Value Functions ($f(x) = |x|$): This function returns the non-negative value of x , resulting in a V-shaped graph. It's characterized by a sharp turn at the vertex $(0,0)$.

Square Root Functions ($f(x) = \sqrt{x}$): The graph of this function starts at $(0,0)$ and increases gradually, only defined for non-negative values of x .

Exponential Functions ($f(x) = a^x$, $a > 0$, $a \neq 1$): These functions exhibit exponential growth ($a > 1$) or decay ($0 < a < 1$). They are characterized by rapid increases or decreases in value.

Logarithmic Functions ($f(x) = \log_a x$, $a > 0$, $a \neq 1$): These are the inverse functions of exponential functions. They show a slow, increasing rate of change.

Rational Functions ($f(x) = p(x)/q(x)$, where $p(x)$ and $q(x)$ are polynomials): These functions involve fractions with polynomials in the numerator and denominator, often displaying asymptotes (vertical and horizontal).

3. Transformations of Algebra 2 Parent Functions

Understanding the transformations applied to algebra 2 parent functions is critical. These transformations involve shifts (vertical and horizontal), stretches (vertical and horizontal), reflections (across the x -axis and y -axis), and combinations thereof. These transformations change the position, shape, and orientation of the parent function's graph without altering its fundamental characteristics.

4. Challenges in Learning Algebra 2 Parent Functions

Students often face challenges in mastering algebra 2 parent functions, including:

Abstract Conceptualization: The abstract nature of functions can be difficult for some students to grasp.

Visualizing Graphs: Connecting algebraic expressions to their graphical representations can be challenging.

Mastering Transformations: Understanding and applying transformations accurately can be complex.

Differentiating Function Families: Recognizing the unique characteristics of each function family requires practice and careful observation.

5. Opportunities Presented by Understanding Algebra 2 Parent Functions

Despite these challenges, a strong understanding of algebra 2 parent functions offers numerous opportunities:

Foundation for Advanced Mathematics: It provides the foundation for calculus and other advanced mathematical concepts.

Problem-Solving Skills: Understanding functions improves analytical and problem-solving skills.

Real-World Applications: Many real-world phenomena can be modeled using these functions.

Improved Mathematical Reasoning: Learning parent functions enhances logical reasoning and critical thinking skills.

6. Strategies for Effective Learning and Teaching

Effective teaching and learning of algebra 2 parent functions require a multi-faceted approach:

Visual Aids: Using graphs, interactive software, and manipulatives can significantly improve understanding.

Real-World Examples: Connecting functions to real-world scenarios makes them more relatable and engaging.

Practice and Application: Providing ample opportunities for practice and application reinforces learning.

Collaborative Learning: Group work and peer instruction can enhance understanding and problem-solving skills.

7. Addressing Common Misconceptions

A common misconception is the belief that memorizing the graphs is sufficient. True understanding requires comprehending the underlying mathematical relationships and how transformations affect the graphs. Another frequent error is incorrectly applying transformations, particularly with horizontal shifts and stretches.

8. Conclusion

Mastering algebra 2 parent functions is paramount for success in higher-level mathematics. By understanding their characteristics, transformations, and applications, students build a strong foundation for future learning and develop crucial problem-solving skills. Addressing the challenges and leveraging the opportunities presented by these fundamental building blocks ensures a solid grasp of advanced mathematical concepts.

FAQs:

1. What is the difference between a parent function and a transformed function? A parent function is the basic form of a function family (e.g., $f(x) = x^2$). A transformed function is a parent function that has undergone shifts, stretches, reflections, or a combination thereof.

1. How do I identify the parent function of a given function? Identify the core function before any transformations are applied. For example, in $f(x) = 2(x-3)^2 + 1$, the parent function is $f(x) = x^2$.
1. What are asymptotes, and how do they relate to rational functions? Asymptotes are lines that the graph of a function approaches but never touches. Rational functions often have vertical and horizontal asymptotes.
1. How are exponential and logarithmic functions related? They are inverse functions of each other. What one function does, the other undoes.
1. Why are transformations important in studying functions? Transformations show how changing the parameters of a function affects its graph and behavior, allowing for a more comprehensive understanding.
1. How can I use algebra 2 parent functions to model real-world situations? Many real-world phenomena, like population growth (exponential), projectile motion (quadratic), and decay rates (exponential), can be modeled using parent functions.
1. What are some common mistakes students make when working with parent functions? Common mistakes include misinterpreting transformations, confusing domain and range, and failing to identify the parent function correctly.
1. What resources are available to help students learn algebra 2 parent functions? Many online resources, textbooks, and educational software programs offer support and practice problems.
1. How can teachers make learning parent functions more engaging for students? Using real-world examples, interactive technology, and collaborative activities can increase student engagement and understanding.

Related Articles:

1. Transformations of Quadratic Functions: This article focuses specifically on transformations (shifts, stretches, reflections) applied to quadratic parent functions and their effects on the graph.
1. Graphing Rational Functions: This article provides a detailed guide on graphing rational functions, including finding asymptotes and intercepts.
1. Solving Exponential and Logarithmic Equations: This article explores methods for solving equations involving exponential and logarithmic functions.
1. Applications of Exponential Functions: This article delves into real-world applications of exponential functions, such as population growth, compound interest, and radioactive decay.
1. Understanding Function Composition: This article explains the concept of function composition and how it applies to different function families.
1. Inverse Functions and Their Properties: This article explores the concept of inverse functions and their relationship to the original functions.
1. Domain and Range of Functions: This article provides a comprehensive explanation of the domain and range of various functions.
1. Polynomial Functions and Their Graphs: This article explores the characteristics and graphs of polynomial functions of various degrees.
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and provides real-world examples of their use.

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Editor: Dr. Sarah Chen, PhD in Mathematics, Associate Professor of Mathematics at Stanford University, specializing in curriculum development and assessment in mathematics education.

algebra 2 parent functions: CK-12 Calculus CK-12 Foundation, 2010-08-15 CK-12 Foundation's Single Variable Calculus FlexBook introduces high school students to the topics covered in the Calculus AB course. Topics include: Limits, Derivatives, and Integration.

algebra 2 parent functions: Core Connections , 2016

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algebra 2 parent functions: College Algebra Jay Abramson, 2018-01-07 College Algebra provides a comprehensive exploration of algebraic principles and meets scope and sequence requirements for a typical introductory algebra course. The modular approach and richness of content ensure that the book meets the needs of a variety of courses. College Algebra offers a wealth of examples with detailed, conceptual explanations, building a strong foundation in the material before asking students to apply what they've learned. Coverage and Scope In determining the concepts, skills, and topics to cover, we engaged dozens of highly experienced instructors with a range of student audiences. The resulting scope and sequence proceeds logically while allowing for a significant amount of flexibility in instruction. Chapters 1 and 2 provide both a review and foundation for study of Functions that begins in Chapter 3. The authors recognize that while some institutions may find this material a prerequisite, other institutions have told us that they have a cohort that need the prerequisite skills built into the course. Chapter 1: Prerequisites Chapter 2: Equations and Inequalities Chapters 3-6: The Algebraic Functions Chapter 3: Functions Chapter 4: Linear Functions Chapter 5: Polynomial and Rational Functions Chapter 6: Exponential and Logarithm Functions Chapters 7-9: Further Study in College Algebra Chapter 7: Systems of Equations and Inequalities Chapter 8: Analytic Geometry Chapter 9: Sequences, Probability and Counting Theory

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algebra 2 parent functions: College Algebra Ron Larson, Robert P. Hostetler, 1997

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learning approach in the standard first two semesters of calculus, including approximately 200 activities and 500 exercises. In the HTML version, more than 250 of the exercises are available as interactive WeBWorK exercises; students will love that the online version even looks great on a smart phone. Each section of Active Calculus has at least 4 in-class activities to engage students in active learning. Normally, each section has a brief introduction together with a preview activity, followed by a mix of exposition and several more activities. Each section concludes with a short summary and exercises; the non-WeBWorK exercises are typically involved and challenging. More information on the goals and structure of the text can be found in the preface.

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algebra 2 parent functions: Bim Bts Algebra 2 Student Edit Ion Ron Larson, 2018-04-17

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the best of us, especially for the masses that have never counted math as their forte. But here's the good news: you no longer have to suffer through statistics, sequences, and series alone. Algebra II For Dummies takes the fear out of this math course and gives you easy-to-follow, friendly guidance on everything you'll encounter in the classroom and arms you with the skills and confidence you need to score high at exam time. Gone are the days that Algebra II is a subject that only the serious 'math' students need to worry about. Now, as the concepts and material covered in a typical Algebra II course are consistently popping up on standardized tests like the SAT and ACT, the demand for advanced guidance on this subject has never been more urgent. Thankfully, this new edition of Algebra II For Dummies answers the call with a friendly and accessible approach to this often-intimidating subject, offering you a closer look at exponentials, graphing inequalities, and other topics in a way you can understand. Examine exponentials like a pro Find out how to graph inequalities Go beyond your Algebra I knowledge Ace your Algebra II exams with ease Whether you're looking to increase your score on a standardized test or simply succeed in your Algebra II course, this friendly guide makes it possible.

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algebra 2 parent functions: *The College Panda's SAT Math* Nielson Phu, 2015-01-06 For more sample chapters and information, check out <http://thecollegepanda.com/the-advanced-guide-to-sat-math/>

This book brings together everything you need to know to score high on the math section, from the simplest to the most obscure concepts. Unlike most other test prep books, this one is truly geared towards the student aiming for the perfect score. It leaves no stones unturned. Inside, You'll Find: Clear explanations of the tested math concepts, from the simplest to the most obscure Hundreds of examples to illustrate all the question

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Introduction to Algebra - Math is Fun

Algebra is just like a puzzle where we start with something like " $x - 2 = 4$ " and we want to end up with something like " $x = 6$ ". But instead of saying "obviously $x=6$ ", use this neat step-by-step ...

Algebra I - Khan Academy

The Algebra 1 course, often taught in the 9th grade, covers Linear equations, inequalities, functions, and graphs; Systems of equations and inequalities; Extension of the concept of a ...

Algebra | History, Definition, & Facts | Britannica

May 9, 2025 · Algebra is the branch of mathematics in which abstract symbols, rather than numbers, are manipulated or operated with arithmetic. For example, $x + y = z$ or $b - 2 = 5$ are ...

Algebra - What is Algebra? | Basic Algebra | Definition - Cuemath

Algebra is the branch of mathematics that represents problems in the form of mathematical expressions. It involves variables like x , y , z , and mathematical operations like addition, ...

How to Understand Algebra (with Pictures) - wikiHow

Mar 18, 2025 · Algebra is a system of manipulating numbers and operations to try to solve problems. When you learn algebra, you will learn the rules to follow for solving problems. But ...

What is Algebra? - BYJU'S

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People who do algebra use the rules of numbers and mathematical operations used on numbers. The simplest are adding, subtracting, multiplying, and dividing. More advanced

operations ...

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Free algebra tutorial and help. Notes, videos, steps. Solve and simplify linear, quadratic, polynomial, and rational expressions and equations.

1-5 Assignment - Parent Functions and Transformations

Aug 1, 2017 · Title: Microsoft Word - 1-5 Assignment - Parent Functions and Transformations.docx Created Date: 7/23/2017 9:11:43 PM

Algebra II: Translations on Parent Functions Review

%PDF-1.7 %i³Å× 1 0 obj > endobj 2 0 obj > endobj 3 0 obj > endobj 4 0 obj >/MediaBox[0 0 612 792]/Parent 2 0 R /Resources >/Font >/ProcSet[/PDF/Text/ImageB ...

Evaluating and Graphing Functions - Kuta Software

Kuta Software - Infinite Algebra 2 Evaluating and Graphing Functions Name _____

Date _____ Period _____ -1-Evaluate each function for the given value. 1) $f(x) = 4x + 6$; Find $f(0)$ 2) $f(x) = x$...

1.1 Extra Practice - Big Ideas Learning

Algebra 2 Copyright © Big Ideas Learning, LLC Practice Workbook and Test Prep All rights reserved. 6 Name _____ Date _____ 1. Solve the system using any method.

MTH 111 - College Algebra Course Notebook - OSU Open ...

May 26, 2018 · 1. Identify the parent functions studied in this course, given their graphical, symbolic, or numerical representations. 2. State the domain and range of the parent functions ...

Function Family Fun - Radford University

various information and data to use to investigate different parent functions. Students will use GeoGebra to explore and recall properties about the various parent functions (absolute value, ...

CCommunicate Your Answerommunicate Your Answer - Big ...

Section 1.1 Parent Functions and Transformations 5 Describing Transformations A transformation changes the size, shape, position, or orientation of a graph. A translation is a transformation ...

Functions - Edmentum

Functions . 7 ©Edmentum. Permission granted to copy for classroom use. Parent Functions A . function family . is a group of functions that have the same parent function. Parent. functions ...

parent functions - Fort Bend ISD

The following parent functions will be included in the Algebra II curriculum: Quadratic = 2 Absolute value yx Square root yx Cube yx x3 Cubic root yx 3 Exponential y 2 Logarithm yx g2 Here is a ...

2.1 Transformations of Quadratic Functions - Algebra 2

Section 2.1 Transformations of Quadratic Functions 51 Writing a Transformed Quadratic Function Let the graph of g be a translation 3 units right and 2 units up, followed by a refl

ection in the y ...

HW34: Function Transformations - Mrs. Rowland Math

Algebra 1 HW34: Function Transformations ... Graph the four basic functions. 1) Linear x y-8-6-4-22468-8-6-4-2 2 4 6 8 2) Absolute Value x y-8-6-4-22468-8-6-4-2 2 4 6 8 3) Quadratic x y-8-6 ...

F.BF.B.3: Transformations with Functions 1 - JMAP

5 If the parent function of $f(x)$ is $p(x) = x^2$, then the graph of the function $f(x) = (x-k)^2 + 5$, where ... 12 The students in Mrs. Smith's algebra class were asked to describe the graph of $g(x) = 2$...

1.9 Intro to Parent Functions STDNT - Math 50

Algebra 2 / Trigonometry 1.9: Intro to Parent Functions Concord High RNB Briones 2 1-9 Introduction to Parent Functions Check It Out! Example 1 a $g(x) = x^3 + 2$ $g(x) = x^3 + 2$ is cubic. x ...

Algebra 2 - Pearson

Algebra 2 Semester A Summary: In this course, students will learn, practice, and apply skills and strategies that will help them grow into strong mathematical thinkers. The course presents ...

Transformation of Functions Worksheet - Loyola University ...

Algebra 2-Trig Name _____ Unit 1: Lesson 3 Transformations of Graphs Hour _____ Graph the following functions without using technology. Feel free to use a graphing calculator to check ...

Algebra 2 Overview 2023-2024 - Fort Bend ISD

Grading Period 2 Unit 3: Quadratic Relations and Functions Estimated Date Range: 10/11 - 11/7 Estimated Time Frame: 20 days Unit Overview: In this unit, students will explore quadratic ...

2 Quadratic Functions - Big Ideas Learning

Section 2.1 Transformations of Quadratic Functions 47 Essential Question How do the constants a , h , and k affect the graph of the quadratic function $g(x) = a(x - h)^2 + k$? The parent function ...

EXPLORE IT Graphing Cube Root Functions - Big Ideas Learning

5.4 Graphing Cube Root Functions 267 EXAMPLE 3 Graphing $y = a\sqrt[3]{x - h} + k$ Graph $g(x) = 2\sqrt[3]{x - 3} + 4$. Describe the transformations from the graph of $f(x) = \sqrt[3]{x}$ to the graph of g

1.5 Shifting, Reflecting, and Stretching Graphs - Franklin

are derived by shifting, stretching, shrinking, or reflecting the parent graphs shown above. Shifts, stretches, shrinks, and reflections are called transformations. Many graphs of functions can ...

1 EXPLORATION: Identifying Basic Parent Functions - Big ...

1. $h(x) = +2$ 5. $2f(x) = -3$ 6. $g(x) = +2$ 7. $f(x) = -1$ 2 8. $h(x) = +4$ 9. $f(x) = 5$ In Exercises 10-15, graph the function and its parent function. Then describe the

transformation. 10. $f(x) = 3x + 1$...

Algebra 2 STUDY GUIDE AII.6, AII.7 Functions Mrs. Grieser

Algebra 2 STUDY GUIDE AII.6, AII.7 Functions Mrs. Grieser Page 2 3) Sketch the graphs using transformations. List the parent function and the transformations you are making. Where ...

Algebra 2 Unit Plan - orange.k12.nj.us

Functions (2-6) 17 Check up Revisiting lesson 18 Solving Systems Using Tables and Graphs (3-1) 19 20 21 Solving systems Using Tables and Graphs(3-1) 22 Solving Systems algebraically ...

Communicate Your Answer

Section 1.1 Parent Functions and Transformations 5 Describing Transformations A transformation changes the size, shape, position, or orientation of a graph. A translation is a transformation ...

Algebra 2, Unit 5: Cubic, Cube Root and Rational Functions ...

Questions? Please contact your Algebra 2 teacher. --Your EM-S ISD Algebra 2 Team
Algebra 2, Unit 5: Cubic, Cube Root and Rational Functions and Equations Our Learning Goals: We ...

Algebra 2 Unit ...

Gina Wilson (All Things Algebra}, 2015 '25 - Name: Date: Unit 7: Exponential & Logarithmic Functions Homework 3: Intro to Logarithms ... Homework 5: Graphing Logarithmic Functions ...

Using Parent Graph Transformations to Create Art By ...

first parent equation Walk around and support students as they create their own functions
Students will: Graph the parent equation from any of the other function families such as $y = \sqrt{x}$, ...

Unit 10 - Graphing Quadratic Functions

May 14, 2020 · Unit 10.1 To graph quadratic functions in standard form. Parent Function: The most basic quadratic function is $f(x) = x^2$. This function is often called the parent quadratic ...

TEKS- Algebra 2 - TXAR

Parent Functions and Transformations (2A.4) Algebra and geometry. The student connects algebraic and geometric representations of functions. The student is expected to: (A) identify ...

Unit 6 - Radical Functions

Homework 7: Graphing Radical Functions ** This a 2-page document ** For questions 1-2: Describe the transformations from the parent function. stretch 21 x-axis , 3. The square root parent ...

Algebra 2 Notes on Sections 2-1 Using Transformations to ...

Algebra 2 Notes on Sections 2-1 Using Transformations to Graph Quadratic Functions This

chapter is about the Quadratic function. The graph of a quadratic function is a parabola. ...

00i ALG2SN TP SE 890870 - McGraw Hill Education

2-7 Parent Functions and Transformations31 2-8 Graphing Linear and Absolute Value Inequalities33 Tie It Together ... Chapter 1 1 Glencoe Algebra 2 Before you read the ...

1.3 Practice: Transformations of Absolute Values - Washoe ...

Compare the two functions represented below. Determine which of the following statements is true. Function $f(x)$ Function $g(x)$ 1 3 a. The functions have the same vertex b. The ...

Student Lesson: Absolute Value Functions

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Unit 1 Guided Notes - Miss Seitz's Online Classroom

2.3 2.4 Piecewise Functions □ Graph piecewise functions □ Write equations of piecewise functions CB 2.4 Absolute Value Functions and Step Functions □ Graph absolute value and step functions 2.7 ...

Worksheet 2.4 Parent Functions & Transformations No...

Worksheet 2.4—Parent Functions & Transformations Show all work on a separate sheet of paper. Give simplified, exact values for all answers. No Calculator is Permitted unless specifically ...

Transforming Functions Worksheet Key - Miami Killian Senior ...

Nov 4, 2016 · c. $\frac{1}{2}f(-x + 4) - 2$ (Remember to factor first!) Order of Transformations 1. Stretches/Compressions and Reflections 2. Translations Know the form $y = a(b(x - c) + d)$...

Algebra II Lesson 3: Transformation Rules for Algebraic ...

3. ||||| 4. The order of operations for transformations is similar to those of equations; we deal with the multiplication before addition/subtraction. For graphs of functions involving more ...

Evaluating and Graphing Functions - Kuta Software

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Chapter 1 Opener: Functions and Transformations - Big Ideas ...

Identify parent functions. Use transformations to graph functions. Describe characteristics of functions . Solve real-life problems using linear and absolute value functions.

1.1 Functions, #Domain, #and#Range#4#Worksheet

6)&Determine&the&domain&and&range&of&eachofthefollowingrelations.Useagraphingcalculatorora graphingapptohelp&ifnecessary.Makearoughsketchofthegraph. & &

a)&!=-!+3 ...

EXPLORE IT Graphing Radical Functions - Big Ideas Learning

5.3 Graphing Radical Functions 247 Graphing Transformations of Radical Functions In Example 1, notice that the graph of f is a horizontal stretch of the graph of the parent square root ...

Characteristics of Linear Functions (pp. 1 of 8) - Algebra 1

Algebra 2 HS Mathematics Unit: 04 Lesson: 01 ©2010, TESCCC 08/01/10 Characteristics of Linear Functions (pp. 1 of 8) ... Characteristics of Linear Functions (pp. 1 of 8) KEY Parent ...

Mueller, Felice 9/30/13 10/1/13 - bpb-us-w2.wpmucdn.com

2.A.4A: Identify and sketch graphs of parent functions, including linear, quadratic, absolute value, and square root. 2.A.4B: extend parent functions with parameters such that as a in $f(x)=a/x$...

Graphing Rational Functions.ks-ia2 - Kuta Software

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1.2 Transformations of Linear and Absolute Value Functions

12 Chapter 1 Functions and Transformations EXAMPLE 1 Writing Translations of Functions Let $f(x) = 2x + 1$. a. Write a function g whose graph is a translation 3 units down of the graph of f

Algebra II: Translations on Parent Functions Review - Math ...

Algebra II: Translations on Parent Functions Review Name _____ Period _____ Date _____ For problem 1- 6, please give the name of the parent function and describe the transformation ...

Parent Function Homework - Mrs. Snow's Math

Parent Function Homework # 1- 6 Give the name of the parent function. 1. $g(x) = x^2 - 1$ 3. $f(x) = 21x$ 5. $h(x) = x^2$ 2. $g(x) = x^3 + 3$ 4. $g(x) = \dots$ #15 - 22 Given an example of an equation ...

CYCLE #1 P.2—Parent Parent Functions and Transformations

Worksheet P.2—Parent Functions & Transformations Without a calculator, set up the equation for, then sketch the graph of each of the following functions $g(x)$ using any (or all) of the functions ...

Graphing Absolute Value Functions Date Period - Kuta Software

-2- ©j 7290 q1m2K 0KJu Et xa3 TSToMfytsw wayrie 0 7L sL PCx. T P LAalal R CruiBgjh ltRs X 5rOeus7eLrEvvebdB.y n OM6a QdQeb Lw 5i rt phY zllnaf jiVnBiQtcen eA yl XgOe7bRrua f z1 ...

Algebra 2 Parent Functions

Algebra 2 Parent Functions

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