

# MP4a-Radical Functions and Geometry

Content Area: **Math**  
Course(s): **Math 8 Algebra 1 Honors**  
Time Period: **Marking Period 4**  
Length: **MP4**  
Status: **Published**

## Essential Questions

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- How can you choose a model to represent a real-world situation?

## Big Ideas

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- Extend the properties of exponents to rational exponents.
- Use properties of rational and irrational numbers.
- Create equations that describe numbers or relationships.
- Solve equations and inequalities in one variable.
- Interpret functions that arise in applications in terms of the context.
- Analyze functions using different representations.
- Build new functions from existing functions.

## Technology Integration

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8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results

8.1.8.B.1 Synthesize and publish information about a local or global issue or event (ex. telecollaborative project, blog, school web).

8.1.8.C.1 Collaborate to develop and publish work that provides perspectives on a global problem for discussions with learners from other countries.

Activity:

To enhance and deepen understanding of linear systems, students play a game of [Polygraph Linear Systems](#). Students are given the opportunity to work with classmates virtually, exploring communication through the computer to describe and answer questions regarding linear systems. Students must use algebraic terms and knowledge to successfully get their partner to select the correct graph based on questions that have been asked.

## Enduring Understandings

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## The Real Number System

N.RN.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.

N.RN.3 Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

## Creating Equations

A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

## Reasoning with Equations & Inequalities

A.REI.4a [M] Use the method of completing the square to transform any quadratic equation in  $x$  into an equation of the form  $(x - p)^2 = q$  that has the same solutions. Derive the quadratic formula from this form.

## Interpreting Functions

F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity

F.IF.7b Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

## Building Functions

F.BF.4a Solve an equation of the form  $f(x) = c$  for a simple function  $f$  that has an inverse and write an expression for the inverse. For example,  $f(x) = 2x^3$  or  $f(x) = (x+1)/(x-1)$  for  $x \neq 1$ .

## Mathematical Practices Focus

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1. Make sense of problems and persevere in solving them. Lessons 0-1, 1-8, 2-4, 3-4, 4-5, 5-4, 6-4, 7-5, 8-8, 9-3, 10-5, 11-1, 12-4
2. Reason abstractly and quantitatively. Lessons 1-3, 2-1, 3-3, 4-1, 5-1, 6-5, 7-2, 8-5, 9-1, 10-3, 11-8, 12-2
3. Construct viable arguments and critique the reasoning of others. Lessons 1-3, 2-5, 3-5, 4-2, 5-5, 6-1, 7-4, 9-2, 10-4, 11-2, 12-1
4. Model with mathematics. Lessons 1-1, 2-9, 3-2, 4-5, 5-1, 6-5, 7-6, 8-7, 9-7, 10-4, 11-7, 12-5

5. Use appropriate tools strategically. Lessons 1-7, 2-4, 3-2, 4-4, 5-6, 6-1, 7-5, 8-2, 9-6, 10-6, 11-8, 12-3
6. Attend to precision. Lessons 1-3, 2-8, 3-4, 4-2, 5-2, 6-6, 7-4, 8-9, 9-5, 10-1, 11-6, 12-2
7. Look for and make use of structure. Lessons 1-2, 2-5, 3-6, 4-1, 5-5, 6-3, 7-7, 8-6, 9-6, 10-2, 11-2, 12-8
8. Look for and express regularity in repeated reasoning. Lessons 1-4, 2-7, 3-1, 4-1, 5-4, 6-1, 7-1, 8-4, 9-3, 10-2, 11-5, 12-6