07 Radical Functions and Equations

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **2 weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

This unit will focus on strengthening the prerequisite skills and conceptual understanding needed to graph radical functions and identify key components of a radical function. Lesson activities will reinforce new content and address common misconceptions and errors to support students' progress toward analyzing radical functions and solving radical equations.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Objectives/Enduring Understandings:

- Solving equations is a process
- Radical functions expand possible situations that can be modeled graphically.

Essential Questions:

- When radical graphs are transformed, how does this effect the structure of the equation of the graph?
- How can the domain and range be determined upon inspection of the graph of the radical function?
- How can the domain be determined by examining the structure of the equation of the radical equation?
- How can extraneous solutions occur with radical equations?

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will understand that:

- There is a relationship between radicals and exponents.
- There are properties of radicals and exponents.
- The properties of inequalities will be reviewed prior to studying this unit
- Squaring a binomial will be task that will be reviewed prior to studying this unit
- The appropriate domain and range of a radical function contributes to its graph and behavior.

Procedural Knowledge

Students will be able to:

- Square a binomial
- Solve inequalities
- Write expressions in equivalent forms to solve problems
- Solve radical equations
- Graph radical functions
- Distinguish between linear and exponential functions

CONTENT AREA STANDARDS

MA.F-IF.B.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.
MA.F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
MA.F-IF.C.7b	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
MA.F-LE.A.1	Distinguish between situations that can be modeled with linear functions and with exponential functions.
MA.F-LE.A.1a	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
MA.F-LE.A.1b	Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
MA.F-LE.A.1c	Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
MA.A-REI.A.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
MA.A-REI.D.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion

CS.K-12.3.a	Identify complex, interdisciplinary, real-world problems that can be solved computationally.
CS.K-12.3.b	Decompose complex real-world problems into manageable sub-problems that could integrate existing solutions or procedures.
CS.K-12.3.c	Evaluate whether it is appropriate and feasible to solve a problem computationally.
LA.K-12.NJSLSA.R7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
TECH.9.4.12.IML.3	Analyze data using tools and models to make valid and reliable claims, or to determine optimal design solutions (e.g., S-ID.B.6a., 8.1.12.DA.5, 7.1.IH.IPRET.8).
TECH.9.4.12.IML.4	Assess and critique the appropriateness and impact of existing data visualizations for an intended audience (e.g., S-ID.B.6b, HS-LS2-4).
TECH.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
TECH.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.

EVIDENCE OF LEARNING

Formative Assessments

- Student feedback/questioning/observation
- Error analysis
- Specific skill assessment/questions
- Survey/polling
- Task completion and review of quizzes and material presented in the Algebra II class

Summative Assessments

There will be no formal assessments in this course.

RESOURCES (Instructional, Supplemental, Intervention Materials)

Desmos Activities: Multiplying Polynomials with Area Tiles (Slides 13 onwards), Solving Inequalities Practice, Solving radical equations, Radical Equation Practice, Solving Radical Equations with Extraneous Solutions,

Kuta Software worksheets

Approved course textbook

INTERDISCIPLINARY CONNECTIONS

Interdisciplinary connections are frequently addressed through modeling and application problems whereby students solve and analyze situations taken from business, physics, engineering, biology, statistics, geography, and numerous other fields. Examples can be found in topic specific textbook problems and digital resources.

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.