

CC Algebra 2 - Regents Review

Unit #7: Transformations of Functions

Video by Mr. Williamson
Newfield Senior High School

Based on Kirk Weiler's
emathinstruction lessons

Unit 7 Video Overview

- Video Overview
- Unit 7 Lesson Overview
- CCLS Associated with Unit 7
- Formulas
- General Rules for Performing Transformations
- Vertical Transformations
- Horizontal Transformations
- Identifying a Series of Transformations Between Two Functions
- Even vs. Odd Functions
- Summary

Unit 7: Lesson Overview

- 7.1 Shifting Functions
- 7.2 Reflecting Parabolas
- 7.3 Vertically Stretching Functions
- 7.4 Horizontally Stretching Functions
- 7.5 Even and Odd Functions

CCLS Associated with Unit 7

- ❖ F.BF.3 – Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.* Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.

Formulas

❖ Test for Even Functions

❖ Test for Odd Functions

General Rules for Performing Transformations

- ❖ Order matters!! (Follow the general rule for Order of Operations – PEMDAS)

Vertical Transformations

- ❖ Vertical Stretch / Compression
- ❖ Vertical Reflections
- ❖ Vertical Shifts

Horizontal Transformations

- ❖ Horizontal Stretch / Compression
- ❖ Horizontal Reflections
- ❖ Horizontal Shifts

Identifying a Series of Transformations Between Two Functions

❖ Order Matters!

Describe a series of transformations that maps f onto g as well as f onto h .

$$f(x) = x^2$$

$$g(x) = -3(x+10)^2 + 8$$

$$h(x) = \frac{1}{2}(4x-12)^2 + 9$$

Even vs. Odd Functions

❖ Even Functions

❖ Odd Functions

Summary of Most Important Information

- ❖ Students should be able to:
 - ❖ Examine an equation or a graph of a function to determine how it was transformed from its parent function.
 - ❖ Sketch the graph of a function given the original graph and the transformation written in function notation.
 - ❖ Identify the graph of a function as either even, odd, or neither by examining its symmetries.
 - ❖ Algebraically determine whether a function is even, odd, or neither.
 - ❖ Sketch missing portions of a graph given that it is even or odd.