

2.6 – Transformations of Functions

Be sure to follow [College Algebra formatting guidelines](#) in your work. We will be doing a lot more with graphing techniques in future weeks.

NEATNESS COUNTS. Maybe do a couple drafts before submitting...

1. (10 pts) Transform the graph of $f(x) = \sqrt{x}$ to the graph of $g(x) = -4\sqrt{-5x-20} + 64$, by the methods of my old Writing Project #2:

- a. Library of Basic Functions
 - i. [Notes](#) (See Page 6 for Square-Root Function)
 - ii. [Square-Root Function Video](#) (and all even-indexed roots).
- b. Stretching, Shrinking, Reflecting, and Shifting Basic Functions
 - i. [Notes on Basic Moves](#)
 - ii. [Video on Basic Moves](#)
 - iii. [Notes on Combining the Moves](#)
 - iv. Videos on Combining the Moves
 1. [Method 1](#) – Preferred by Algebra Students
 2. [Method 2](#) – Preferred by Trigonometry and Calculus Students
- c. There are numerous examples of Square-Root Functions in Spring, 2016 Writing Project #2. I notice that 8 years ago, the Method 1 and Method 2 were reversed.

The difference between the two methods is that the Method 1 in the videos above is the student-preferred method, which does the horizontal shift before the horizontal stretch/shrink/reflect. Less fractions.

Method 2 in the above is the teacher-preferred method, which does the horizontal stretch/shrink/reflect, first, and then it does the horizontal shift.

- i. [Spring, 2016 Writing Project #2](#) (Check out all the square root examples!)
- ii. [Spring, 2016 Writing Project #2 Solutions](#)

2. (5 pts Bonus) Find the *exact* x - and y -intercepts of $g(x)$ from #1. Include them in your final graph.

3. (10 pts) Sketch the graph of $g(x) = \frac{-4}{(-5x-20)^3} + 64$ by transforming a basic function. The basic function is

$f(x) = \frac{1}{x^3}$, which is described on Page 9 on the [Library of Basic Function Notes](#), which is included with the reciprocal function as far as its basic shape goes. See [Reciprocal Function Video](#), which covers .

$\frac{1}{x}, \frac{1}{x^3}, \frac{1}{x^5}, \dots, \frac{1}{x^{2n+1}}$, i.e., all the reciprocals of odd-powered power functions.

A more complete set of resources for graphing by transformations is here: [Writing Project #2 Notes and Videos](#). I've linked you to specific pages of notes and specific videos for the exercises I assigned, but there are lots more basic functions in the [Basic Functions Notes and Videos](#).