MAT 121 Writing Project #2 Fall, 2017

Graphing Functions by Transforming Basic Functions

FORMATTING: This is semi-formal writing, here. You don't have to type it out, but you do need to be very clear. For the formatting guidelines, please see Writing Project #1. They're the same for tests and (face-to-face) homework, except on tests, don't waste time writing out the question details.

Online Students: Bring your Writing Project with you to the testing center, and turn it in before you take the test. Early Birds may mail the Writing Project to my mailing address, given in the syllabus.

DEADLINE for 10% Bonus is MONDAY, October 2nd. Online students, bring it in or snail-mail it, with postmark by Monday, October 2nd. Solutions will be revealed Tuesday morning.

Main Resources: Chapter 2 Videos (and notes) and Writing Project 2 Videos (and notes).

Main Method: 0. $f(x) \Rightarrow$ 1. $a\,f(x) \Rightarrow$ 2. $a\,f(x+c) \Rightarrow$ 3. $a\,f(bx+c) \Rightarrow$ 4. $a\,f(bx+c)+d = g(x)$

Method 2: 0. $f(x) \Rightarrow$ 1. $a\,f(x) \Rightarrow$ 2. $a\,f(bx) \Rightarrow$ 3. $a\,f\left(b\left(x+\frac{c}{b}\right)\right) \Rightarrow$ 4. $a\,f\left(b\left(x+\frac{c}{b}\right)\right)+d = g(x)$

Method 2 seems tougher for most beginners, but is more in keeping with what's ahead of you in mathematics.

Graph the function $g(x)$ by transforming the graph of a basic function, $f(x)$.

1. $g(x)=3\sqrt[4]{7x-35}-2$ (Use $(0,0),(1,1)$, and $(16,2)$ as the 3 points in the 1st graph.)

2. $g(x)=-3\sqrt[4]{7x-35}+2$ (Use $(0,0),(1,1)$, and $(16,2)$ as the 3 points in the 1st graph.)

3. $g(x)=7\sqrt{-5x-20}-12$

4. $g(x)=\dfrac{2}{(-3x+21)}-5$

5. $g(x)=\dfrac{2}{(-3x+21)^2}-5$

6. $g(x)=7(5x+30)^5+8$

We treat lines and parabolas a little differently. They come up so often - plus the completing-the-square trick – we sidestep the whole $f(bx)$ issue and just work with $g(x)=a(x-h)^2+k$ and $g(x)=m(x-h)+k$.

7. $g(x)=2(x-11)+1$

8. $g(x)=2(x-11)^2-7$

9. $g(x)=x^2-6x-7$

10. $g(x)=4x^2+5x+17$

One reason I stress point-slope form is that $y=m(x-h)+k$ corresponds to: $y=m(x-x_1)+y_1$.

The "cheat" for completing the square: $g(x)=ax^2+bx+c=a(x-h)^2+k=a\left(x+\frac{b}{2a}\right)^2+g\left(-\frac{b}{2a}\right)$