MAT 121-G13 Writing Project #2 Fall, 2018

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 and Writing Projects, don't waste time writing out the question details, because they come WITH (the cover sheet).

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 FRIDAY, September 28th. Otherwise, just bring it with you to the test on Wednesday, October 3rd. Solutions will be revealed Monday, October 1st.

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

Method 1: 0. $f(x) \Rightarrow$ 1. $3f(x) \Rightarrow$ 2. $3f(x+2) \Rightarrow$ 3. $3f(5x+2) \Rightarrow$ 4. $3f(5x+2)+7=g(x)$

1. $(x,y)\mapsto(x,3y)$ 2. $(x,y)\mapsto(x-2,y)$ 3. $(x,y)\mapsto\left(\frac{1}{5}x,y\right)$ 4. $(x,y)\mapsto(x,y+7)$

Method 2: 0. $f(x) \Rightarrow$ 1. $3f(x) \Rightarrow$ 2. $3f(5x) \Rightarrow$ 3. $3f\left(5\left(x+\frac{2}{5}\right)\right) \Rightarrow$ 4. $3f\left(5\left(x+\frac{2}{5}\right)\right)+7=g(x)$

1. $(x,y)\mapsto(x,3y)$ 2. $(x,y)\mapsto\left(\frac{1}{5}x,y\right)$ 3. $(x,y)\mapsto\left(x-\frac{2}{5},y\right)$ 4. $(x,y)\mapsto(x,y+7)$

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

1. $g(x)=\frac{2}{5x+15}+7$ (Use $(0,0),(1,1)$, and $(-1,-1)$ as the 3 (x,y)'s in the 1st graph.)

2. $g(x)=5(7x+21)^{1/4}-13$ (Use $(0,0),(1,1)$, and $(16,2)$ as the 3 points in the 1st graph.)

3. $g(x)=\frac{2}{(5x+15)^2}+7$ (Asymptotes!)

4. $g(x)=-5\sqrt{6x-12}+13$

5. $g(x)=5\sqrt[3]{3x-18}+11$

6. $g(x)=7(5x+30)^4+8$

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 $g(x)=m(x-h)+k=m(x-x_1)+y_1$.

7. $g(x)=5(x-3)+5$

8. $g(x)=-5(x-3)^2+9$

9. $g(x)=x^2-8x-9$

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

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: $g(x)=ax^2+bx+c=a(x-h)^2+k=a\left(x-\frac{-b}{2a}\right)^2+g\left(-\frac{b}{2a}\right)$