MAT 121-G81, G82 Writing Project #2 Spring, 2022

Graphing Functions by Transforming Basic Functions

FORMATTING: This is semi-formal writing, here. That means show some professionalism. You don't have to type it out, but you do need to be very clear. See Course Schedule for due dates. **Staple this page, with your name on it, as a cover sheet for your project. Do not staple your project to your test. This project is due Friday, February 25th.**

1. Write on only one side of each page. I will not award (or deduct) points for anything on the backs of pages.
2. Plain white paper without lines (8 ½ x 11-inch A4 copier paper works just fine). Paper with lines:
3. Staple top left corner. Do NOT staple over problem numbers or any of your work. If I can't see it, you didn't do it.
4. Leave margins. "MAT 121" in big letters in top left corner of every page solves all problems with margins.
5. Write DARK. I don't mind if you use pen. Just put a line through mistakes. Pencil's good, but make sure you're getting it DARK, i.e., BLACK, with a white background.
6. Leave ROOM between problems and between steps on your work. I have bad eyes, so being stingy with space and paper is a mistake on Writing Projects. **Don't do work in 2 columns!**

For early feedback, make a black-and-white, multi-page PDF and upload it to the D2L drop-box for Writing Project #2. Otherwise, mail your neat, clear, black-and-white, one-side-of-each-page work to me at:

Harry Mills
EDBH 134K
Aims Community College
5401 West 20th Street
Greeley, CO 80634

Alternatively, you may just slide it under my office door in Ed Beaty by or before the deadline: EDBH 134K

Mail or E-Mail your Writing Project 2 by or before Friday, February 25th. Late work accepted as late as Thursday, March 3rd, at a 20% discount.

Main Resources: Chapter 2 Videos (and notes), Writing Project 2 Videos (and notes), and a selection of Old Writing Projects.

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

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

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

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

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.)

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3. $g(x)=\dfrac{2}{(5x+15)^2}+7$ (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: $g(x)=ax^2+bx+c=a(x-h)^2+k=a\left(x-\dfrac{-b}{2a}\right)^2+g\left(-\dfrac{b}{2a}\right)$