MAT 201 Take-Home Test 3 Re-Take, Fall, 2021 Name_____
30 Points Covers Chapter 3 Graphing

Use unlined, 8 ½ x 11 inch paper. You may slide your completed Take-Home Test under my door on Greeley Campus at EDBH 134 K, or mail it to:

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

You may also submit a clean, high-contrast PDF scan in an e-mail attachment to hmills1@online.aims.edu. I reserve the right to refuse faint, hard-to-read scans, or scans that have gray writing against a gray background (low contrast is bad).

Use A4 letter paper or printer paper, without lines and without graph paper. You may use a straight-edge, but if you're a slave to scale, your graphs will not exhibit key features, especially concavity.

SHOW ALL WORK!!! USE A LEGEND AND LETTER LABELS TO LABEL KEY POINTS, AS DEMONSTRATED IN CLASS.

1. Sketch the graph of the trigonometric polynomial $g(x)=\sin(x)\cos(2x)$ on the interval $[0,\ 2\pi]$.
   a. (15 pts) Show all intercepts, extremes and inflection points. Your graphs must capture the essence of the shape, especially the concavity features. I expect to see your work 4-decimal-place approximations for all *x*- and *y*-values in your legend.
   b. (5 pts bonus) Give the *exact* values for the coordinates of the key points, above. This will improve your "chops." Strong symbol manipulation is a big part of your future math work.

2. (15 pts) Sketch the graph of $R(x)=\dfrac{x^2+3x-3}{x-2}$ over the entire real line. Show all intercepts, extremes, asymptotes (vertical and oblique) and inflection points. If you're a slave to scale, you can lose the essence with graphs that are too vertical for you to handle with a hand sketch. Typically, your first draft of these rational functions with oblique (slant) asymptotes won't be satisfactory. You kind of have to get that first draft done and then refine it. Give me both decimal (4 places) approximations of the key points and *exact* coordinates of key points, as improper fractions, if necessary. No bonus. Sorry.

Organizing your presentation:

I want to see a very clear graph, and a list of the key points, from left to right, labeled alphabetically. I have demonstrated $g(x)=\sin(x)+\cos(x)$ in class, and presented rational functions.