

# Algebra 2 with Trigonometry In Class Group Project

In small cooperative learning groups (3-4 students), your task is to use <http://www.desmos.com> to neatly find functions to match the Massachusetts T Map and create a piecewise-defined function for the yellow, red, blue, green, and silver lines.

Your final grade will be based on:

1. Accuracy and detail of the piecewise-defined function for all lines: yellow, red, blue, green, and silver (omit the hooks at both ends of the silver line). You must take into account domain and range restrictions to earn full credit.
2. Precision of graph in comparison to the actual/current T map. Please label each line by its color.
3. Overall group collaboration and input to the final product. You must be working diligently and cooperatively both days to earn the full credit.



## Directions:

**STEP 1: Create a Desmos account (everyone needs an account but only one person needs to submit this portion of the project)**

You can either sign in with your HPS Google Account or under your own e-mail address and password. You each need an account so you can save and share your work.

### STEP 2: Upload the T-Map

Save the MBTA image provided to your device. In Desmos, click on the (+) button and click on image → Upload. Once the T-map is uploaded place the intersection of the orange line and the red line at the origin.

**STEP 3: Create a piecewise-defined function for the yellow, red, blue, green, and silver lines. Organize your lines by color in folders. (FYI: You must have a minimum of 3 absolute value functions:  $f(x) = a|x - h| + k$ )**

**STEP 4: When you're done, get the link to your work. This can be done with the share button in the top right corner of the website, if you're logged in. Paste the link into the form on [coughlinhhs.weebly.com](http://coughlinhhs.weebly.com).**



## Some quick how-tos:

### How do I turn graphs on and off?

Click the graph icon to turn graphs on or off.

Note that if you click and hold a graph icon, it will give you color, transparency, and



style options.

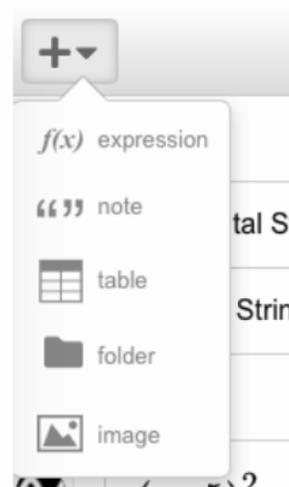
### How do I make my lines thicker?

Click on the  tool on the top right and select "Projector Mode"

### How do I create domain restrictions?

After typing in the equation for the graph, put in brackets { } and write a compound inequality.

$$y = -x \{ -3 < x < .75 \}$$



### How do I make folders to group the functions for each MBTA line?

Press the big + sign in the top left corner below the black bar. You'll get a menu like the one above. "Folder" is the fourth option. You can then drag your equations into folders.

### How do I change colors?

Click the gear icon at the  top of the equations list:

From there, if you click on a graph icon  it will give both color and style options:



### How do I have Desmos find the line of fit for me?

Type in the kind of function you are trying to create. For example, type in  $f(x) = a|x - h| + k$  and when it says

add slider:

click on "all" and in another line type  $(h, k)$  to create a vertex point that you can drag.

### How do I share this project with people in my group?

Click on the  icon and send an email directly to the person or copy the link into an email.