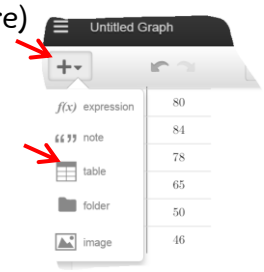
Precalculus Trigonometric Graphs Model Name _____

Assignment Summary: With a partner, choose a topic that can be modeled using the **sine**, **cosine**, or **tangent** function. Use the internet to find data. Explain what the data is and the reason you chose it. Explain why the situation can be modeled by a trig function. Plot your data in Desmos and write a sinusoidal function that fits the data. Enter your equation into Desmos and compare it to your data. Adjust your equation as needed until it closely fits your data. Print your graph, data table, and equation into your document.

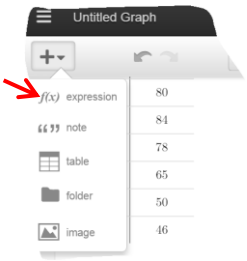
Assignment Details:

1. You must use real-life data. You may not use any examples we have done or that have been handed out in class. No Ferris Wheels, and no Chicago weather. You must use data that can be found in a table on the internet. Explain what your data is and why you chose it. Be specific about the personal relevance of your data, and use complete sentences.

2. Go to Desmos.com to create a scatter plot of the data. In the upper left corner, click the plus sign and create a table. (see picture)



3. Find your data on the graph (look for the appropriate x and y values). By hand, create a sine or cosine function that you think will model the data, and graph the function in Desmos as well. Adjust your function until you think it fits the data well.



Example function for formatting help:

$$-20\cos\left(\frac{2\pi}{9}x - .8\right) + 64$$

4. Print your graph, data table, and function into your document (you can CTRL-P and save it to your Google drive).

5. For Amplitude, Sinusoidal Axis, B-Value, and Phase Shift, explain in detail how you calculated the values and what they represent for your application. Be specific.

6. Discuss the accuracy of your equation to the data. What are reasons you feel that the data might not be exactly fitting the sinusoidal curve?

7. Create one Google document with your graph, function, and explanations. Be sure to write in complete sentences and use clear explanations. Include titles, your names, and web address for data source.

Ideas include:

- Monthly, daily, or hourly high, low, or average temperatures for a city
- length of daylight hours for a city for a year
- number of insects in a location for a year
- monthly rainfall amount for a location
- tide chart for a beach
- monthly crime rate for a city for a year
- peak electricity usage times
- your own idea!

Due: _____

Assignment must be shared with me by the due date: ldimarco@hinsdale86.org

Total Points: 20 Classwork points (see Rubric)

Scoring Rubric:

Data chosen is appropriate for a sinusoidal model. Explanation of why data was chosen and how a sinusoidal function will model it is clear and in complete sentences. Data source is provided (web address). 3 2 1 0
Scatter plot and function are graphed in Desmos and copied into document. Labels and units are used. 3 2 1 0
Equation accurately models data and scatter plot. 3 2 1 0
Detailed, clear explanation is provided for how A, B, C, and D were calculated and what they represent for the real-life data. 3 2 1 0
Accuracy of the equation is discussed and reasons for data set to be different from sinusoidal model are explained. 3 2 1 0
Assignment is typed. Diagrams/Graphs are neat and have labels. 3 2 1 0
Assignment is turned in on time. -1 for one day late. -2 for more than one day late. 2 1 0