SINUSOIDAL FUNCTIONS OF THE WORLD

Due Date: 1/28/2020_____

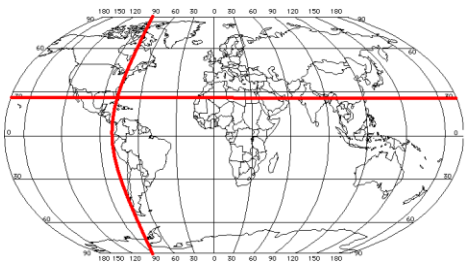
Graph and Function Check: 1/23/2020_____

This project will make you discover the vast differences of daylight minutes from places all around the world using sinusoidal functions. This venture is worth **5 grades** and will require both a construction of the graph as well as a presentation of your selected location.

The project includes:

Display (i.e. poster, slideshow, video, etc…be creative!):

- Graph of the daylight minutes by hand or computer (Label your axes)
- Title of your location (i.e. Miami, Florida, USA or Paris, France)
- World map* with the coordinates of your location
  i.e. Miami, Florida, USA W80° 13', N25° 47'
  *Make sure the map has an equator
- Four trigonometric function representations of the data (choose one to present with your graph, the others can go on the back of your poster or on another slide/segment)
  - $\sin x$
  - $\cos x$
  - $-\sin x$
  - $-\cos x$



- Flag of the country (and city/state, if applicable)
- A characteristic, icon, or notable figure of the city that interests YOU! For example, music, dance, food, sports, etc…be creative*! (Miami, Florida: i.e. Miami Dolphins, oranges, Cuban food, etc.) *Don't just pick the first fact that comes up on Google or Wikipedia.

Presentation:

Answer the following questions:

- What is the maximum and when does it occur? What is the minimum and when does that occur? Specify the date (month and day) and explain why they occur during such times.
- What affects the amplitude of the graph? Describe the time differences and how its location affects it.
- Does another student's city have similar daylight minutes to your city? Why?
- Additional questions may be asked for clarification or curiosity.
- Use terms like Tropic of Cancer, Tropic of Capricorn, Equator, Prime Meridian, hemisphere, tilt of the Earth, solstice, equinox, etc. in your answers. (They are not all required, but a good place to start)

You will be graded as follows:

Trig Functions: _____/ 50 (based on correct transformations and notation)

Presentation: _____/ 25 (25 = flawless, 20 = excellent, 15 = great, 10 = good, 5 = poor)

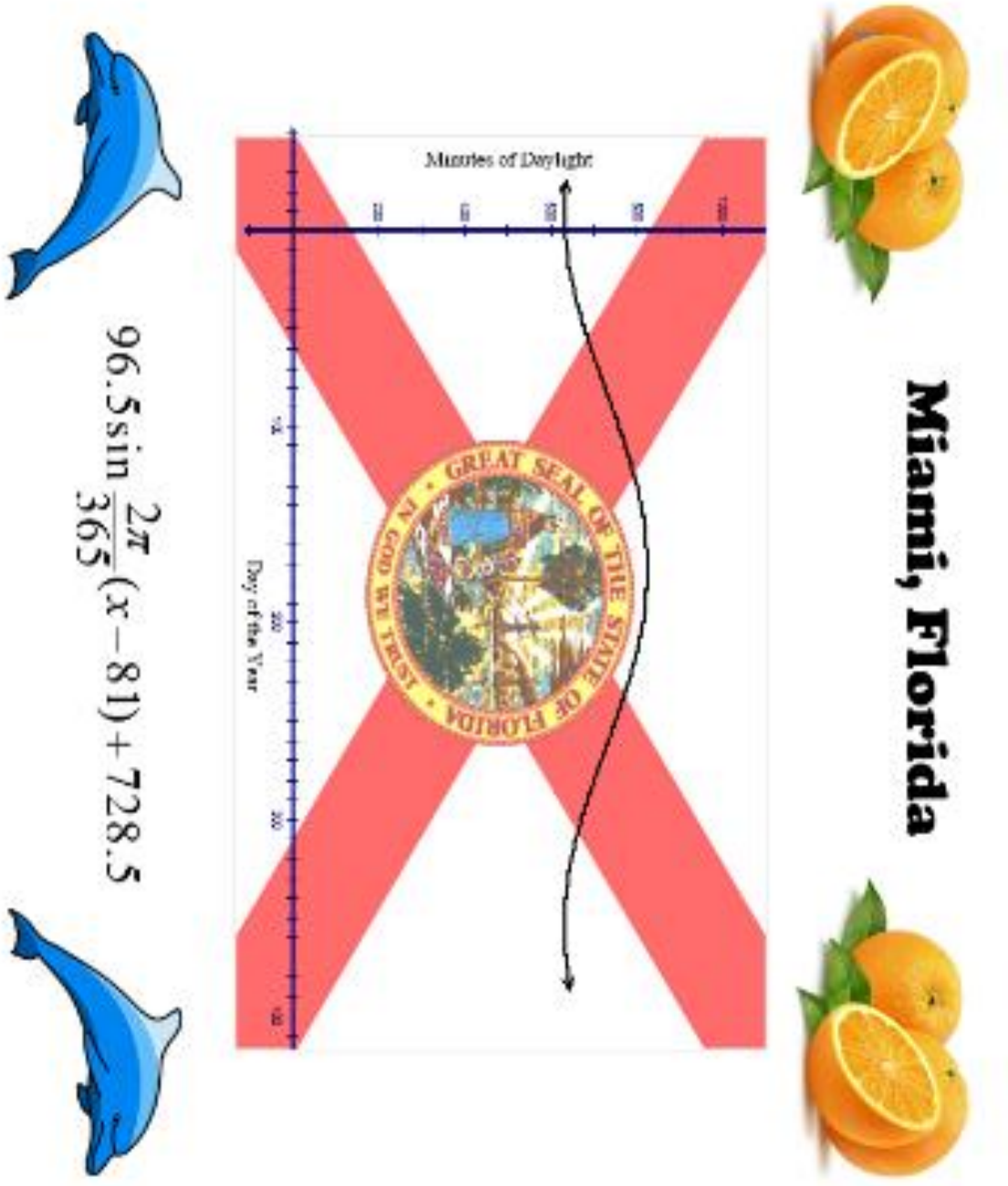
Graph: _____/ 10 (scaled and accurate)

Flag: _____/ 5

Characteristic: _____/ 5

Creativity _____/ 5

Sample Poster setup:



Daylight Minutes of _____

Coordinates _____

Name:
Date:
Period:

Find the number of the day of the year for each date given and the number of daylight minutes (hours x 60 + minutes) for each date given. Then graph the data on graph paper (day of year on the horizontal axis, number of minutes of daylight on the vertical axis).

Date	Day of Year	Hours and Minutes	Minutes of Daylight
Jan 7	7		
Jan 14	14		
Jan 21	21		
Jan 28	28		
Feb 7	38		
Feb 14			
Feb 21			
Feb 28			
Mar 7			
Mar 14			
Mar 21			
Mar 28			
Apr 7			
Apr 14			
Apr 21			
Apr 28			
May 7			
May 14			
May 21			
May 28			
June 7			
June 14			
June 21			
June 28			

Date	Day of Year	Hours and Minutes	Minutes of Daylight
July 7			
July 14			
July 21			
July 28			
Aug 7			
Aug 14			
Aug 21			
Aug 28			
Sept 7			
Sept 14			
Sept 21			
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Dec 28