Name: ________________________________  

Aim: Sinusoidal Graph Applications and Rates of Change

Phases of the Moon Lab Activity

1. Open Google Chrome and copy the following link into the web browser:
   https://www.moongiant.com/calendar/April/2020

   You will see a picture of the moon phase each day during the month of February. For each date, estimate the percentage of luminosity which is the percent of the moon that is illuminated. (Hint: if you click on the image of the moon on each day you will see the actual percentage listed.)

   Be sure to record percentage values as whole numbers (not as decimals): ex. 50% = 50, not .50

2. Using that information, fill in the information below and then plot the data points on the graph below, where y is the percentage of luminosity, and x is the day of the month.

<table>
<thead>
<tr>
<th>Max Value</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min Value</td>
<td>Frequency</td>
</tr>
<tr>
<td>Midline</td>
<td>Horizontal Time Shift (if necessary)</td>
</tr>
<tr>
<td>Amplitude</td>
<td>Sin/cos (+ or -)</td>
</tr>
</tbody>
</table>

Luminosity % (0-100) [not as a decimal]

Day # of April

3. Write the equation that best models this data for each day during the month of April:
Formative Assessment Questions

4. a) According to the data, on what day of the month will a full moon take place?
______________________________________________________________

b) What is the value of the rate of change of the phase of the moon at this time?
_______

[Recall that rate of change refers to the slope of the tangent line at that point!]

5. a) According to the data, on what day of the month will there be no moon showing?
______________________________________________________________

b) What is the value of the rate of change of the phase of the moon at this time?
_______

6. a) Approximately what day of the month is the rate of change of the moon phase increasing the greatest?
______________________________________________________________

[In other words, when is the slope of the tangent line at its steepest positive value?]

7. a) Approximately what day of the month is the rate of change of the moon phase decreasing the most?
______________________________________________________________

[In other words, when is the slope of the tangent line at its steepest negative value?]
If you do not have access to the website link for the lunar calendar, you can use the chart below to help you answer the questions from the previous page.