

Tide Problem: Preliminary Sheet


©2020 [MATHguide](#)

Name: _____

Period: _____

Go to <https://www.desmos.com/calculator/f2oryrw4mk> and answer the following questions using complete sentences.

1) Click on the open circle for the first function. An orange graph will appear.


$$y = \cos n\pi x$$

Imagine the x-axis represents time (hours) and the y-axis represents height (feet). The graph then could represent the height of a tide as it changes from high tide to low tide and back to high tide, and so on.

a) When $n = 1$, how many hours does it take for the tide to go from one high tide to the next high tide?


b) When $n = 1$, how many hours does it take for the tide to go from high tide to the next low tide?

c) When $n = 2$, how many hours does it take for the tide to go from one high tide to the next high tide?

d) When $n = 1$, how many hours does it take for the tide to go from high tide to the next low tide?

e) As the n – value increases, does the length of time between high tide to high tide grow or shrink?

2) Shut off the orange function. Turn on the next function. A blue graph will appear.


$$y = \cos\left(\frac{\pi x}{n}\right)$$

a) When $n = 2$, how many hours does it take for the tide to go from one high tide to the next high tide?

b) When $n = 2$, how many hours does it take for the tide to go from high tide to the next low tide?

c) When $n = 4$, how many hours does it take for the tide to go from one high tide to the next high tide?

d) When $n = 4$, how many hours does it take for the tide to go from high tide to the next low tide?

e) Make a prediction based on your observations. If you wanted a graph that took 13 hours to go from high tide to low tide, what must the n – value be?