Precalculus September 26, 2019, Bogart

Today’s Goals

* Understand what the input and output of y = sin x and y = cos x are and why they are called periodic. Can we go negative rotation to get negative radians? Can we keep on going around the unit circle past 2π and repeat our y values? Why are the maximum and minimum values equal to 1 and -1? Why do they intersect twice in an interval? Why are the zeroes different?
* Model real-world periodic data and identify parts of the equation that match the periodic information from the story. In our equation y = 25 – 20cos(.17453329x), you should be able to look at your hand graph and locate important info in the equation. Is 25 the “midline” of your hand graph? Is 20 the radius of the ferris wheel? Is .17453329 = 2π/36? So we have taken a format for a function that seems to have nothing to do with our story and transformed it into a story about height over time on a ferris wheel ride.
* Transformations of y = sin x and y = cos x. We will first compare graphs in the calculator and then learn how to “paper graph”.
* Amplitude (vertical stretch) = |a|
* Period (horizontal stretch… what is interval for one cycle of the graph = $\frac{2π}{b}$
* Opposites (reflect graph across x-axis) -a
* Vertical translation (changing y-intercept) = d +
* Horizontal translation (phase shift) in sin(bx-c), the function is shifted c/b to the right.
* Y = d + a sin(bx – c) or y = d + a cos(bx – c)
* How to use this information to graph by hand using: (start by deciding on axes intervals)
* How many periods over an interval of 2 π on the x-axis
* Where is my midline?
* Does my interval start at the midline, maximum, or minimum?
* How “tall” is the graph from the midline?
* Graph 4 key points over any period (zeroes, max, and min)
* Connect the curve

HW #2 – pp 304-7: 1-4,5-9 odd, 13-19 odd, 21-24, 25-29 odd, 31, 35, 41, 47, 49, 55, 59, 65-71 odd, 75-77 odd.