

# Lesson Plans - Feb. 2

## Housekeeping

- Office hours: M 2-3, W 3-4, R 9-10
- Test Tuesday, Feb. 23, Chapters 1 and 2
- Yellowish Handout

## Finish Section 2.3

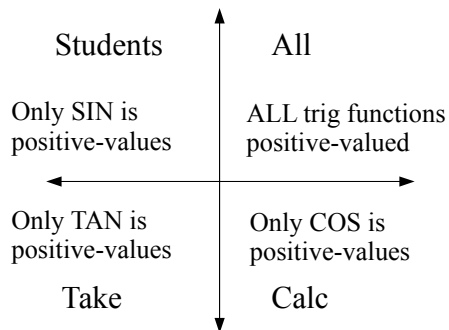
1. Go over handout from 2.3
2. Define  $\cos A$  and  $\tan A$ : For an angle  $A$  in standard position with the point  $(x, y)$  in standard position:

$$\cos A = \frac{\text{horizontal coordinate}}{\text{distance to origin}} = \frac{x}{h}, \quad \tan A = \frac{\text{vertical coordinate}}{\text{horizontal coordinate}} = \frac{y}{x}$$

3. All Students Take Calc: Note that

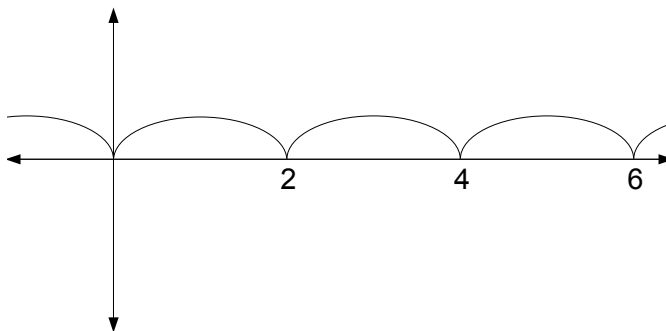
$$\begin{aligned} \sin A &> 0 \text{ in Quadrants I, II} \\ \cos A &> 0 \text{ in Quadrants I, IV} \\ \tan A &> 0 \text{ in Quadrants I, III,} \end{aligned}$$

so we can remember this with the following picture:

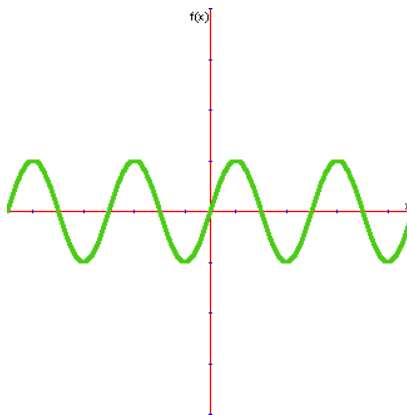


## Section 2.4: Periodic Functions

1. Def: A *periodic* function produces the same output values in the same order over and over. [there is uniform repetition of the same behavior as we move along the horizontal axis]



2. Def: The *period* of a periodic function is the **smallest** distance we need to travel along the horizontal axis in order to complete a complete cycle of the function (that is, to get back to where we started).
3. Examples:
- (a) Suppose the function  $f(x)$  is periodic with period 4. If  $f(2) = 5$ , find three other values of  $x$  such that  $f(x) = 5$ .  
*Answer.*  $x = -2, 6, 10$
- (b) (From book). The function  $g(x)$  is periodic with period 8. If  $g(2.9) = 11.6$ , find  $g(26.9)$ .  
*Answer.*  $g(26.9) = 11.6$ .
4. Trigonometric functions are periodic. What is the period of  $\sin X$ ?



We can see that the shape of the graph repeats after  $360^\circ$ , so the period of  $\sin X$  is  $360^\circ$ .

5. Note that similarly, the period of  $\cos X$  is also  $360^\circ$ , while the period of  $\tan X$  is  $180^\circ$ .
6. Example: Suppose the function  $y = g(x)$  is periodic with period 6. We know that  $g(5) = 3$ .
- (a) Find  $g(17)$ .  
*Answer.*  $g(17) = 3$ .
- (b) Find three values of  $x$  such that  $g(x) = 3$ .  
*Answer.*  $x = -1, 11, 17$ .

### Homework

Read pages 95-99 and 107-110 in the book, and do the following problems:

Section 2.3: #1, 2W, 3ad, 4, 5cd, 7, 9, 10, 11abcd

Section 2.4: #1, 2, 3, 4W, 7, 8, 9, 10

DON'T HAVE TO DO NUMBER 11 IN 2.4.

ALSO, TYPO IN NUMBER 2: SHOULD BE  $y = f(x)$ .