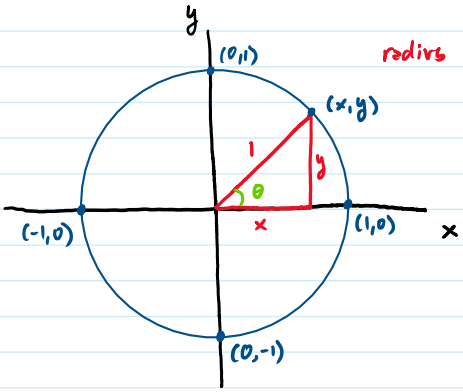
Review Trigonometry

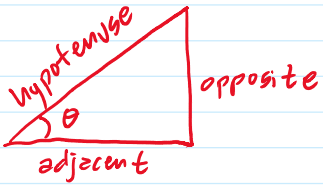
Thursday, October 5, 2023

Objectives:

1. Review Trogonometry Basics

Unit Circle

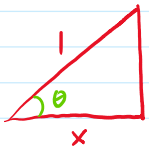




Definitions: Parametrized using θ as angle.

- $\cos(\theta)$

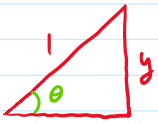
$x = \cos(\theta)$



$$\cos(\theta) = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{x}{1}$$

- $\sin(\theta)$

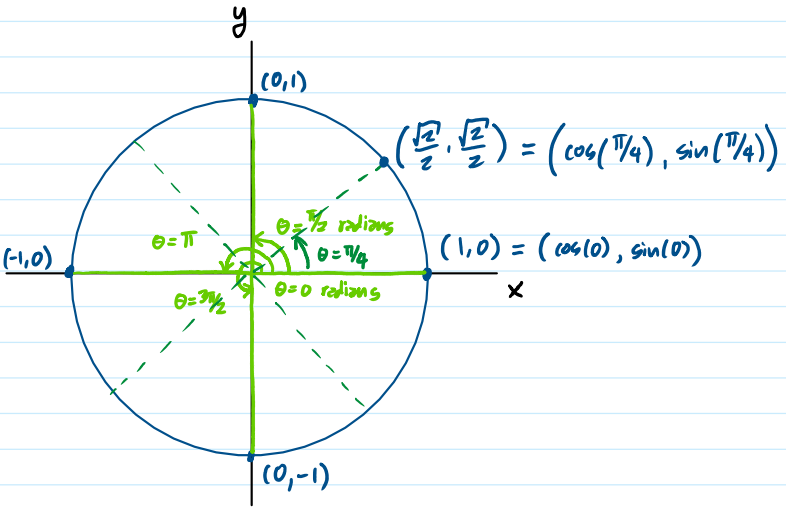
$y = \sin(\theta)$



$$\sin(\theta) = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{y}{1}$$

- $\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)} = \frac{\text{opp/hyp}}{\text{adj/hyp}} = \frac{y}{x}$

parameterized version



In general for some radius r, we have

$$x = r\cos(\theta),\ y = r\sin(\theta),\ \text{and}\ \tan(\theta) = y/x$$

SOHCAHTOA

SOH → $\sin(\theta) = \frac{\text{opp}}{\text{hyp}}$

CAH → $\cos(\theta) = \frac{\text{adj}}{\text{hyp}}$

TOA → $\tan(\theta) = \frac{\text{opp}}{\text{adj}}$

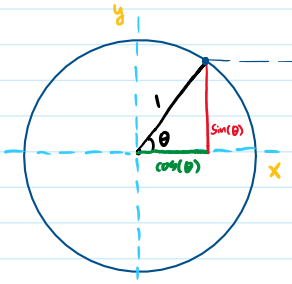
adj

* Note that we have a conventional notation here θ for angle.

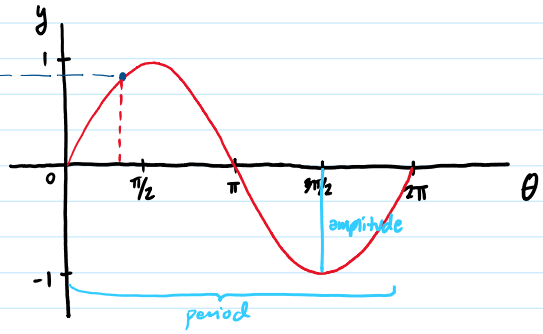
Suppose that θ is on the x-axis.

$\longrightarrow y = \sin(\theta)$

parameterized

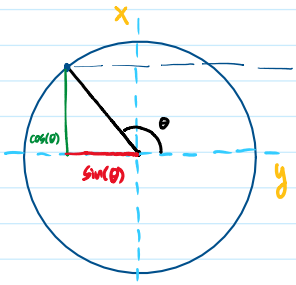


As a function of θ

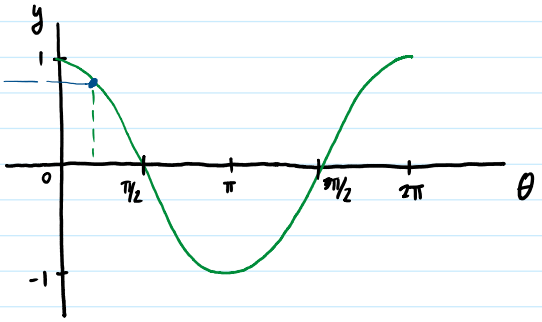


$\longrightarrow x = \cos(\theta)$

parameterized

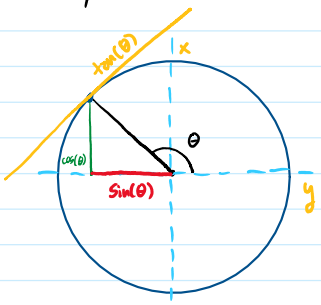


As a function of θ

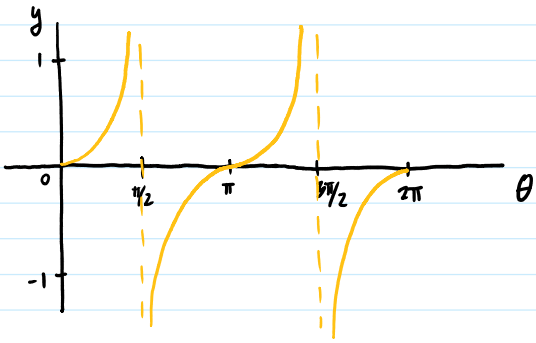


$\longrightarrow \frac{y}{x} = \tan(\theta)$, slope on the unit circle.

parameterized



As a function of θ



* General equation for sine

$$y(\theta) = A\sin(B(x-C)) + D$$

$A \rightarrow$ amplitude

$B \rightarrow$ angular frequency $\rightarrow B = \frac{2\pi}{\text{period}}$

$C \rightarrow$ horizontal shift

$D \rightarrow$ vertical shift