0 [redacted] Webwork A2 due tonight.

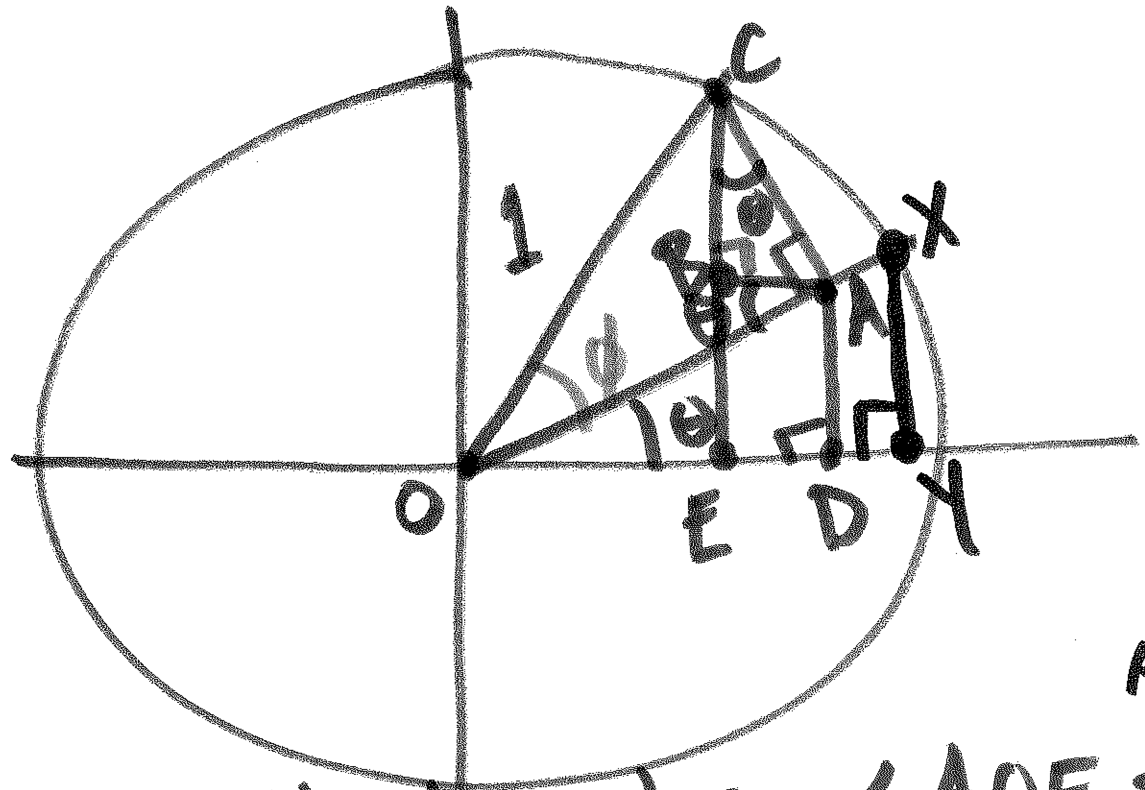
MA 113 1/20/17

1 Turn in your written Assignment. Find the stack for your correct section!!!

2 With your neighbors: Discuss what you have found most difficult and easiest so far in our precalculus review.

From last time: $\cos(\theta+\phi) = \cos\theta\cos\phi - \sin\theta\sin\phi$.

Picture from last time:



My statements at end of last class follow from

$ODA \cong CBA$ ← similar

Also, $CBA \cong OXY$.

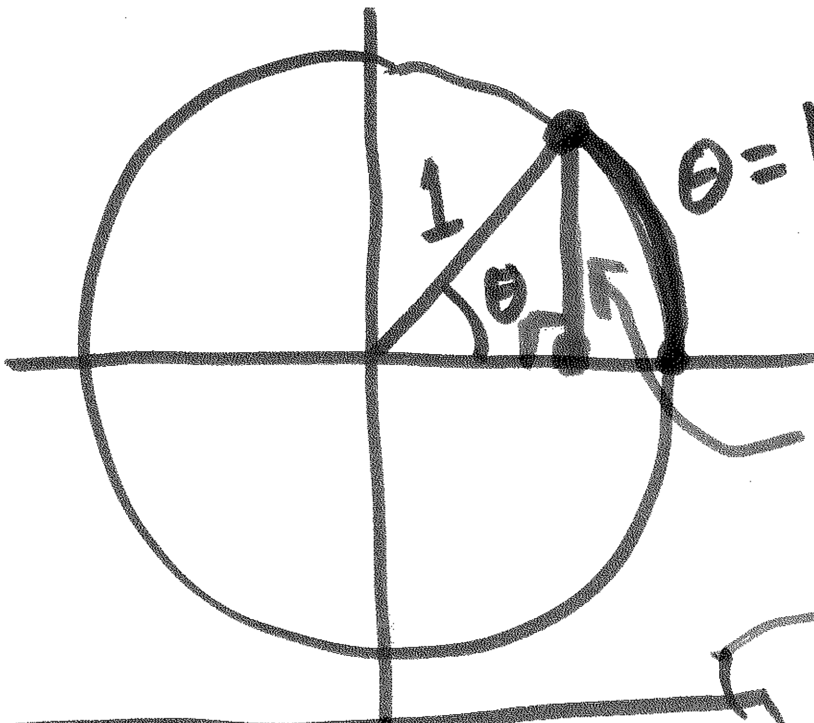
By alt. int. angles, $\angle AOE = \angle BAO$.

$\angle OAB + \angle BAC =$ right angle $= \angle BAC + \angle BCA$.

so, $\Rightarrow$ $\angle OAB = \angle BCA$

Inverse Trig:

Consider $\sin\theta$ first. θ is in radians.



θ = length of this arc. (unit circle)

θ = length of arc

$\Longrightarrow$

$\sin\theta$ = length of vertical line.

Q: Why does this match up w/ definition of $\sin\theta$ as opp/hyp? In this picture, opp $= \sin\theta$, hyp $= 1$. So,

$$\frac{\text{opp}}{\text{hyp}} = \frac{\sin\theta}{1} = \sin\theta.$$

Now, go in reverse.

y = length of vertical line.

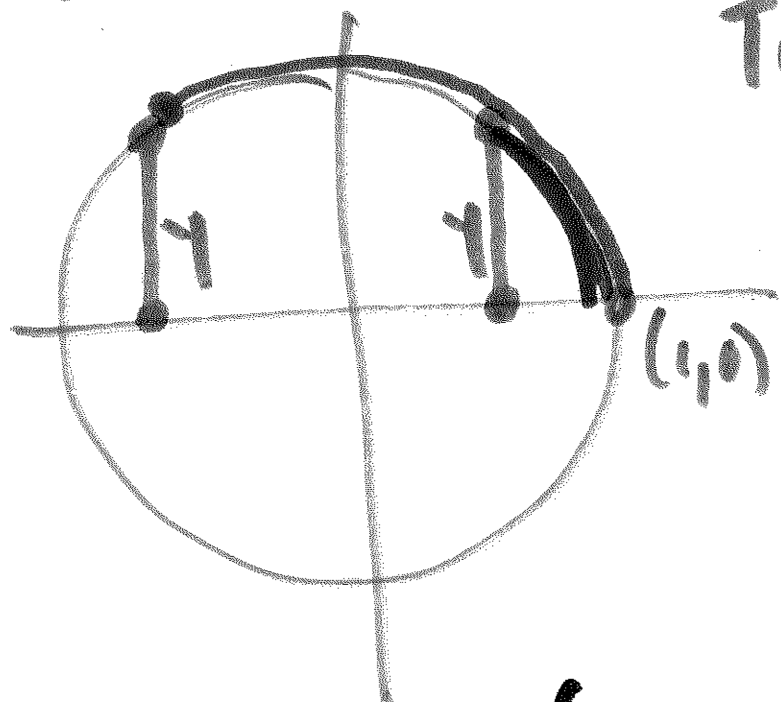
$\Longrightarrow$

$\arcsin y$ = length of arc for that line.

Common notation: $\arcsin\theta = \sin^{-1}\theta$.

we use this notation, but it is confusing.

Issue: which arclength do we use?



Two choices for where to put vertical line length.

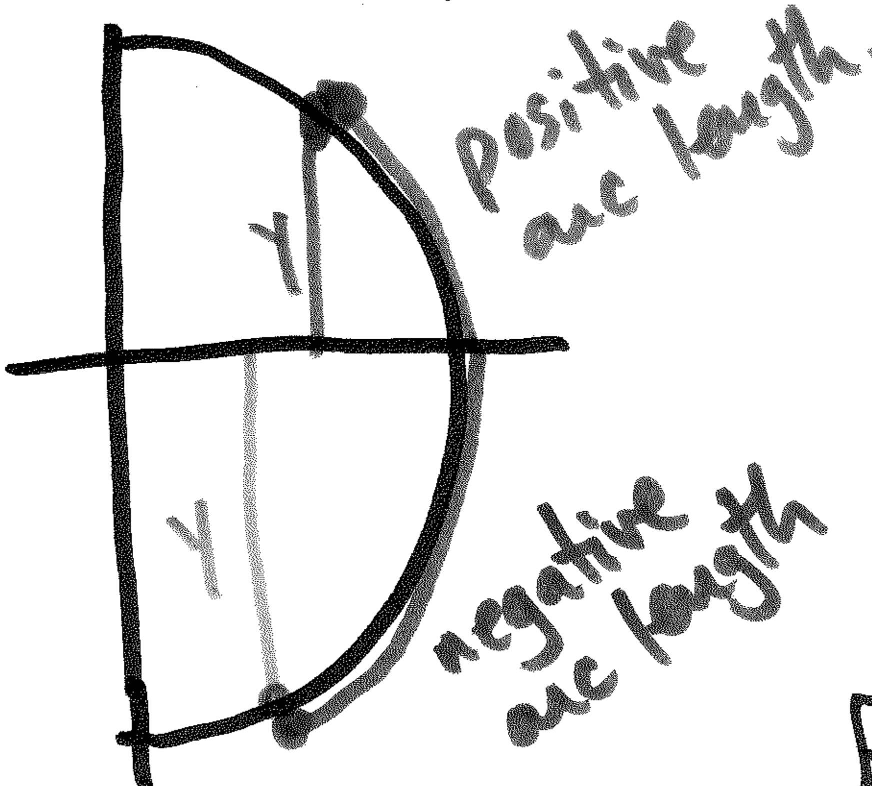
arc is a valid choice for arcsin y.

arc is also legit.

We (as a community) make a common choice which one to use.

Set: Domain for $\arcsin y$ is $[-1, 1]$.

~~the~~ And range of $\arcsin y$ is $\underbrace{\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]}$.



Ex: $\cos\left(\overbrace{\arcsin\left(\frac{11}{14}\right)}^{\theta}\right)$.

I don't know θ.....

But Pyth. Thm can tell me cosθ.

$$\cos\theta = \sqrt{1 - \left(\frac{11}{14}\right)^2}.$$

Ex: $\arcsin(\sin(\pi)) =$

$\arcsin(0) = 0$.

If arcsin is supposed to be inverse function for sin, then why isn't $\arcsin(\sin(\theta)) = \theta$?

This <u>is</u> true if θ is in $[-\frac{\pi}{2}, \frac{\pi}{2}]$.

Similarly, $\sin(\arcsin(y)) = y$ if $-1 \leq y \leq 1$.

See §1.5 for similar info about arccos and arctan.