WebAssign access is thru D2L to get registered.

After you're registered, you can don't need the D2L. Just go to webassign.net and log in directly.

D2L will be our "home base" for e-mail, announcements, dropping off Writing Projects (More on those, Thursday).

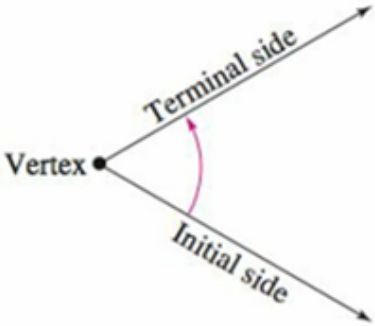
But you should be able to do EVERYTHING ELSE with

webassign.net

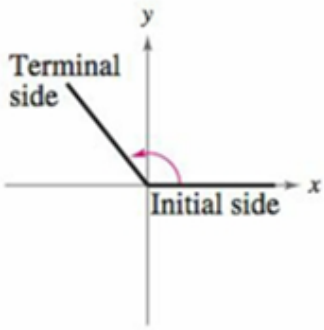
and

harryzaims.com

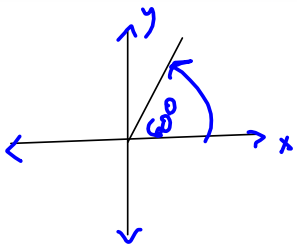
Section 1.1 - Radian and Degree Measure



Angle
Figure 1.1



Angle in standard position
Figure 1.2



360° to go full circle.

RADIAN MEASURE

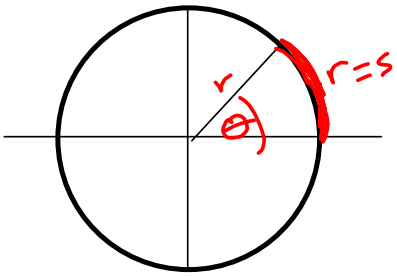
One Radian is the angle corresponding to an arc length equal to the radius r

Radian measure is the ratio of arc length to radius

Theta = θ = Angle in radians = $\frac{s}{r}$

So when $s = r$, $\theta = 1$

$\theta = \frac{r}{r} = 1$ radian $\approx 57^\circ$



$\theta = 1$!

An **angle** is determined by rotating a ray (half-line) about its endpoint. The starting position of the ray is the **initial side** of the angle, and the position after rotation is the **terminal side,** as shown in Figure 1.1. The endpoint of the ray is the **vertex** of the angle. This perception of an angle fits a coordinate system in which the origin is the vertex and the initial side coincides with the positive x-axis. Such an angle is in **standard position,** as shown in Figure 1.2. Counterclockwise rotation generates **positive angles** and clockwise rotation generates **negative angles,** as shown in Figure 1.3. Angles are labeled with Greek letters such as

α (alpha), β (beta), and θ (theta)

γ gamma ω omega

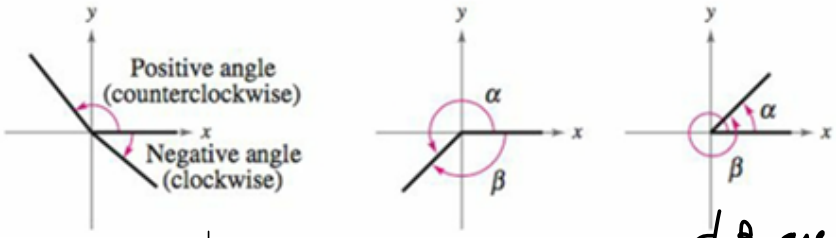
δ delta ξ xi

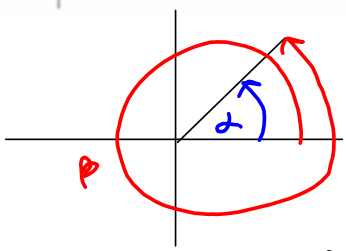
ε epsilon

as well as uppercase letters such as

A, B, and C.

In Figure 1.4, note that angles α and β have the same initial and terminal sides. Such angles are **coterminal.**





α & β are coterminal
They end at the ray.

$\alpha = 45^\circ = \frac{\pi}{4}$

$\beta = 360^\circ + 45^\circ = 405^\circ = \frac{9\pi}{4}$

$2\pi + \frac{\pi}{4} = \frac{(8+1)\pi}{4}$

No symbol after? Means "Radians."

Definition of Radian

One **radian** is the measure of a central angle θ that intercepts an arc s equal in length to the radius r of the circle. See Figure 1.5. Algebraically, this means that

$$\theta = \frac{s}{r}$$

where θ is measured in radians. (Note that $\theta = 1$ when $s = r$.)

$\approx 57^\circ$

What angle, in radians, corresponds to going full circle?

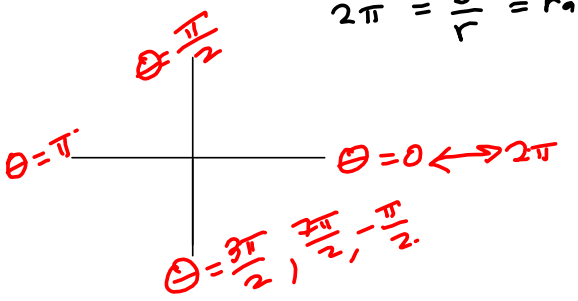
Buehler? Buehler?

Daniel says 2π. He's Right!

What's the circumference of a circle of radius r?

Mayo says $2\pi r = s \Rightarrow$

$2\pi = \frac{s}{r}$ = radian measure of going full circle



$$\frac{2\pi \text{ radians}}{1 \text{ revolution}} = \frac{360^\circ}{1 \text{ revolution}} \Rightarrow$$

$$\frac{\pi}{180^\circ} = \frac{2\pi \text{ radians}}{360^\circ} = \frac{1 \text{ rev}}{1 \text{ rev}} = 1$$

Converting radians to degrees & conversely

If you're given 2.3 radians, to "see" it,

convert $(2.3 \text{ radians})\left(\frac{180^\circ}{\pi \text{ radians}}\right) \approx 131.7802929^\circ$

Approximate.

$= -vs- \approx$

I'm a stickler!

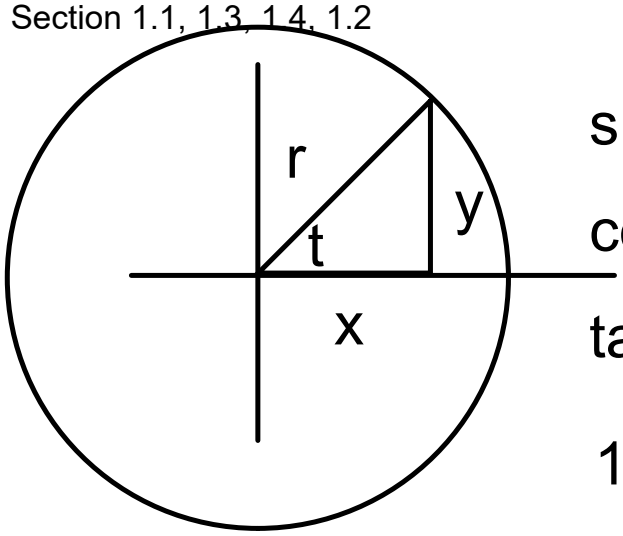
```
2.3*180/π
      131.7802929
```

My name is Steve Mills (Harry)

WebAssign!!!!

Did you find the WebAssign OK?

Section 1.1, 1.3, 1.4, 1.2



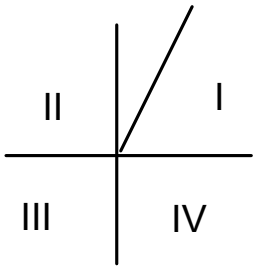
sin(t) = y/r

cos(t) = x/r

tan(t) = y/x

12-point unit circle is...

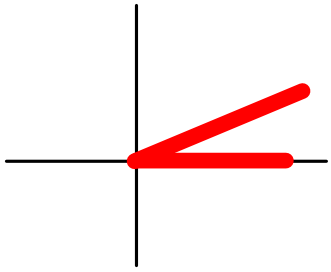
Bleah!



Heuristic learning is when you learn in the context of problem-solving.

Resources on harryzaims.com

When doing homework, have 2 harryzaims.com windows open, one for the notes to locate the exercise and the other for video. IF YOU NEED THAT KIND OF HELP ON AN EXERCISE.



s = rt

s = arc length

r = radius

t = angle in radians

t = s/r

t = s when radius = 1.

Circumference of a circle of radius r is 2 pi r

When r = 1, then circumference = 2 pi

and the number of RADIANS is ALSO 2 pi !!!

That's where s = rt comes from

and s = t, when r = 1, which is really cool!

One full revolution is 360 degrees

One full revolution is 2 pi radians

To convert radians to degrees, multiply by 180/pi

to do the reverse, multiply by pi/180 !

You can get dain bramage from the Cengage guy's talk about the bicycle and converting from rpm to linear speed.

https://harryzaims.com/122/122-fall-21/notes/

https://harryzaims.com/122/122-fall-21/lectures/

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