MAT 122 – TRIG!

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Sem:- Flipped Format:

Small amount of lecture.
Most content delivered online.

Get stuck? Run the video!

COMMON COURTESY.
COMMON SENSE.

Be Disciplined about time!

Osteogenesis. Fragile.

Rough in the section
(Formulas in the "blue" boxes.)

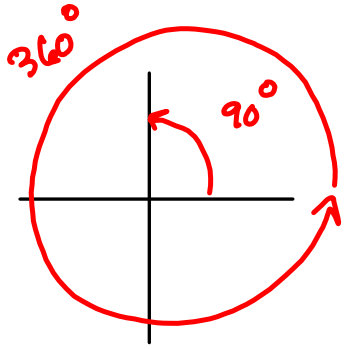
Look at homework.

See Notes that accompany videos.

Go to video.

Homework: Not grading, very carefully, most of the time.

See Solutions!
Compare to your work!
OWN IT!

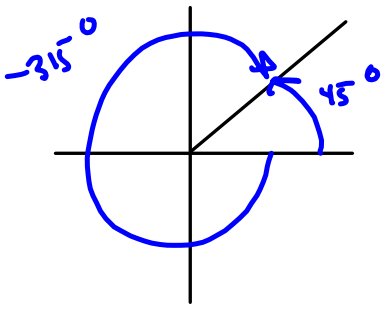


Degree Measure

Measure counter-clockwise from positive x-axis.

Positive measure.

Clockwise is negative



$-360° + 45° = -315°$

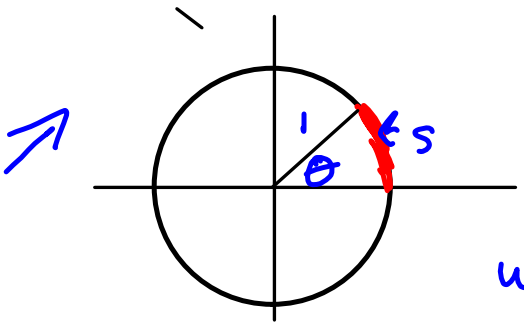
$-315°$ & $45°$ are coterminal

$360° + 45° = 405°$, too!

$\theta = \frac{s}{r} = \frac{\text{arc length}}{\text{radius}}$ = radian measure of θ.

What if $r = 1$?

$\theta = \frac{s}{1} = s$ = arc length.



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

$s = 2\pi r$

When $r = 1$, $s = 2\pi \cdot 1 = 2\pi = \theta$

1 radian $\approx 57^\circ$

"π radians" is very common, e.g., $\frac{\pi}{4}$

$$\left(\frac{2\pi \text{ radians}}{1 \text{ revolution}}\right)\left(\frac{1 \text{ revolution}}{360^\circ}\right) = \frac{2\pi}{360} \frac{\text{rads}}{\text{degree}}$$

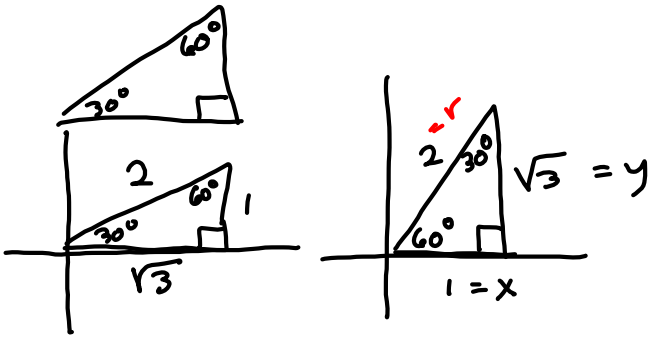
To convert from degrees to radians:

$(45^\circ)\left(\frac{2\pi \text{ radians}}{360 \text{ degrees}}\right) = \frac{\pi}{4}$ radians.

$\frac{2\pi}{360^\circ} = \frac{\pi}{180^\circ}$ is what we use for the conversion

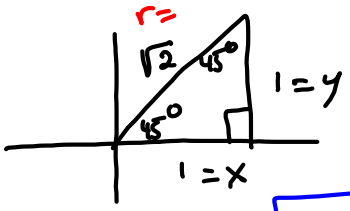
See Bicycle problem

I wanna warn ya against memorizing the trig ratios on the unit circle. Instead, learn these triangles:



hypotenuse: side opposite the right angle

θ = theta.

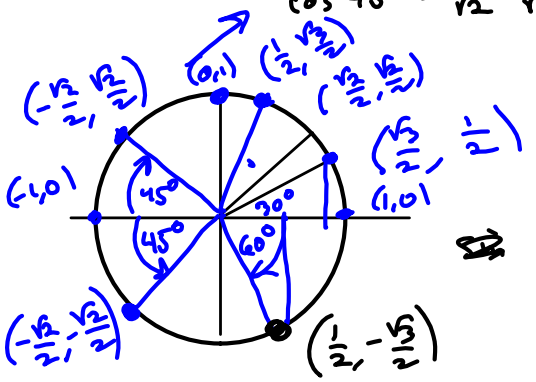


sine: $\sin\theta = \frac{y}{r} = \frac{\text{opposite}}{\text{hypot.}}$

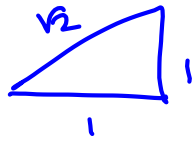
cosine: $\cos\theta = \frac{x}{r} = \frac{\text{adjacent}}{\text{hypot.}}$

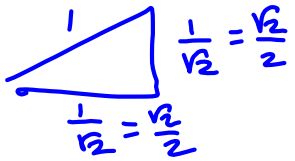
$\sin 30^\circ = \frac{1}{2}$

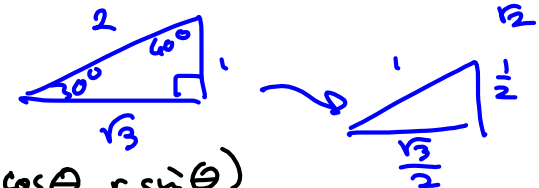
$\cos 45^\circ = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{2}\cdot 2} = \frac{\sqrt{2}}{\sqrt{4}} = \frac{\sqrt{2}}{2}$



when r = 1







$(x,y) = (r\cos\theta, r\sin\theta)$

When r = 1:

$(x,y) = (\cos\theta, \sin\theta)$