§1.1 #53

$s = 150$ km

$r = 80$ km

$\theta = \frac{s}{r}$ = radian measure of the angle.

$= \frac{150}{80} = \frac{15}{8}$ radians

S' 1.2 Use Fig 17 & 18 but don't
waste too much time on it

§1.2 Cheat Sheet.

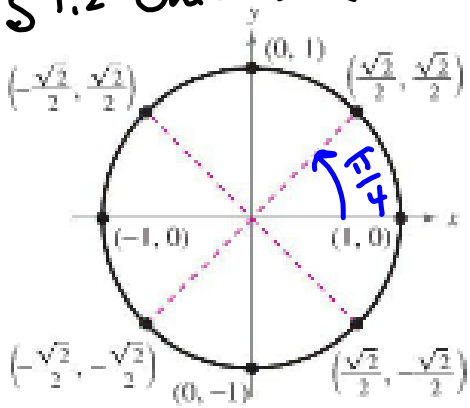


Figure 1.17

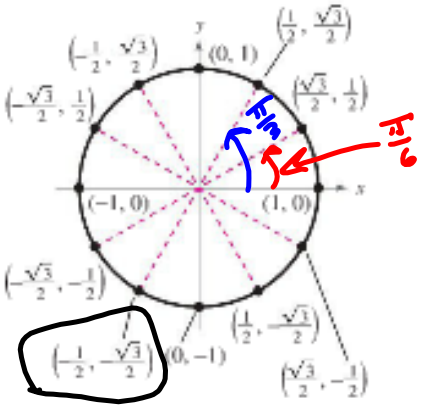


Figure 1.18

On the unit circle,

$\csc\theta = \frac{1}{\sin\theta} = \frac{1}{x}$

$\sec\theta = \frac{1}{\cos\theta} = \frac{1}{y}$

$\cot\theta = \frac{1}{\tan\theta} = \frac{x}{y}$

$\sin\theta$ = y-coordinate

$\cos\theta$ = x-coordinate

$\tan\theta = \frac{y}{x}$

t	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$
x	1	$\frac{\sqrt{2}}{2}$	0	$-\frac{\sqrt{2}}{2}$
y	0	$\frac{\sqrt{2}}{2}$	1	$\frac{\sqrt{2}}{2}$
sin t	0	$\frac{\sqrt{2}}{2}$	1	$\sqrt{2}/2$
cos t	1	$\frac{\sqrt{2}}{2}$	0	$-\sqrt{2}/2$
tan t	0	1	∄	-1

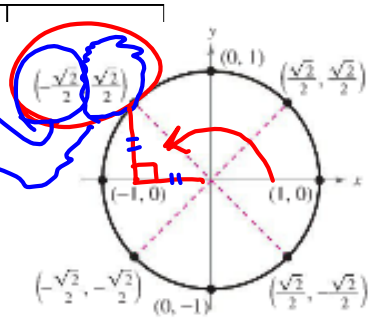
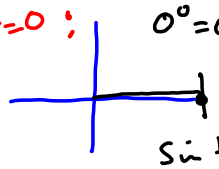


Figure 1.17

$t=0$: $0°=0$ rad



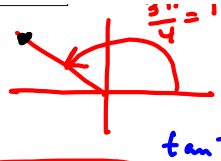
$\sin t =$

$x=1=\cos t$

$y=0=\sin t$

$\frac{0}{1}=\frac{y}{x}=\tan t$

$\frac{3\pi}{4}$



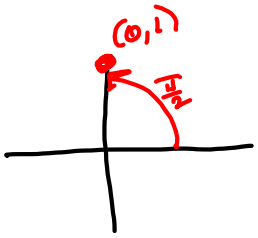
$\tan t =$

$\frac{\sqrt{2}}{2} : \frac{-\sqrt{2}}{2}$

$\frac{\sqrt{2}}{2}\cdot\left(-\frac{2}{\sqrt{2}}\right)$

$=-1=\tan\left(\frac{3\pi}{4}\right)$

$t=\frac{\pi}{2}$:



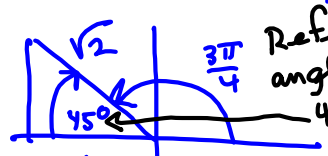
$x=0=\cos t$

$y=1=\sin t$

$\frac{y}{x}=\frac{1}{0}$ ∄

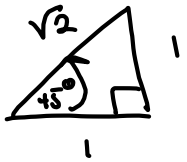
BUILD REFERENCE TRIANGLE FROM GIVEN ANGLE

$\theta=\frac{3\pi}{4}$



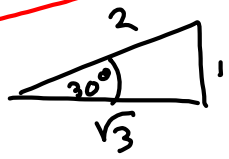
Reference angle is $45°=\frac{\pi}{4}$ Radians

45-45 right triangle



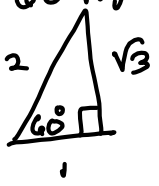
$30°=\frac{\pi}{6}$ $60°=\frac{\pi}{3}$ $45°=\frac{\pi}{4}$ $90°=\frac{\pi}{2}$ $0°=0$

30-60 right triangle

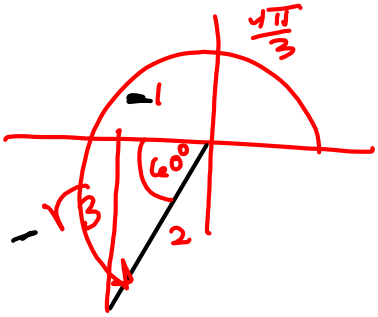


Learn these!

MEMORIZE!



$\frac{4\pi}{3}$



$\frac{5\pi}{2} + 2\pi = \frac{5\pi + 4\pi}{2} = \frac{9\pi}{2}$

$\frac{5\pi}{2} - 2\pi = \frac{5\pi - 4\pi}{2} = \frac{\pi}{2}$ isn't negative,

so subtract ANOTHER 2π:

$\frac{\pi}{2} - 2\pi = \frac{\pi - 4\pi}{2} = -\frac{3\pi}{2}$

$\frac{4}{7}$

Coterminal Angles between -2π & $+2\pi$
-360° & $+360^\circ$

for something BIG!

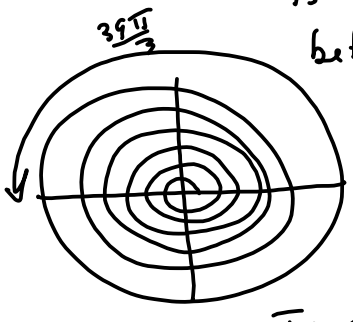
like $\frac{39\pi}{3}$. Find how many 2π's are in it:

$\frac{\frac{39\pi}{3}}{2\pi} = \frac{39\pi}{6\pi} = \frac{39}{6} = 6\frac{1}{2}$ 2π's in it.

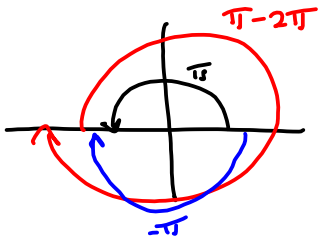
Now $6 \cdot 2\pi = 12\pi$

and $\frac{39\pi}{3} - 12\pi = \frac{39\pi - 36\pi}{3} = \frac{3\pi}{3} = \pi$

is the coterminal angle between 0 & 2π:



To get negative coterminal, subtract 2π from π:



$\pi - 2\pi = -\pi$

So $\pi, -\pi$ are pos. & neg. angles coterminal with $\frac{39\pi}{3}$