Practice: 02 may 2023

a) $\sin(150^\circ) = 180 - 150 = 30^\circ \longrightarrow$ SAI: $\sin(150) = \overset{30}{}\ \frac{1}{2} = \sin(30)$

b) $\cos(540^\circ) = 540 - 360 = 180^\circ \longrightarrow$ coterminal angles $\longrightarrow \cos(\overset{180}{540}) = -1$

c) $\cos(210^\circ) = 180 - 210 = -30 \longrightarrow$ SAI: $\cos(210^\circ) = -\cos(-30^\circ) \to$ NAI: $-\cos(-30)^\circ = -\frac{\sqrt{3}}{2}$

$-\cos 30^\circ$

d) $\sin\left(-\frac{7\pi}{6}\right) =$

e) $\tan\left(\frac{8\pi}{3}\right) = \tan\left(2\pi + \frac{2\pi}{3}\right) \to \tan\left(\frac{2\pi}{3}\right) =$ SAI: $-\tan\left(\frac{\pi}{3}\right) = \tan\left(\frac{2\pi}{3}\right) = -\sqrt{3}$

f) $\sec\left(-\frac{11\pi}{6}\right) =$

$\boxed{\text{working with radians}}$

- rule: if θ_1 & θ_2 are coterminal $\longrightarrow$ $\sin\theta_1 = \sin\theta_2$
  $\cos\theta_1 = \cos\theta_2$
  ...... etc

ex 60° and 420° differ by 360
So sin, cos, tan, etc are the same

$60 \xrightarrow[\text{1 full round}]{} 420 \xrightarrow[\text{2 full rounds}]{} -300$

ex $\frac{17\pi}{6} \longrightarrow \frac{17\pi}{6} - 2\pi = \left(\frac{17}{6} - 2\right)\pi \longrightarrow \left(\frac{17}{6} - \frac{12}{6}\right)\pi = \frac{5\pi}{6}$

$\frac{5\pi}{6} \rightsquigarrow \frac{\pi}{6}$ $\quad \sin\left(\frac{17\pi}{6}\right) = \sin\left(\frac{5\pi}{6}\right) = \sin\left(\frac{\pi}{6}\right)$

$\downarrow$

Supplement angles $\quad \frac{1}{2}$

$\frac{5\pi + \pi}{6} = \frac{6\pi}{6} \to \pi \to 180^\circ$

PRACTICE w/ radians:

a) $\sin\left(\frac{9\pi}{2}\right) = \frac{9\pi}{2} - 2\pi = \left(\frac{9}{2} - 2\right)\pi \to \left(\frac{9}{2} - \frac{4}{2}\right) = \frac{5\pi}{2}, -2\pi = \frac{\pi}{2}$ (90°)

$\frac{5\pi}{2} \leftrightarrow \frac{\pi}{2}$ $\sin\left(\frac{9\pi}{2}\right) \leftrightarrow \sin\left(\frac{5\pi}{2}\right) \leftrightarrow \sin\left(\frac{\pi}{2}\right)$

coterminal so $\sin\left(\frac{9\pi}{2}\right) = 1$

b) $\cos\left(-\frac{23\pi}{3}\right) = -\frac{23\pi}{3} + 8\pi = \left(-\frac{23}{3} + 8\right)\pi \to \left(-\frac{23}{3} + \frac{24}{3}\right) = \frac{\pi}{3}$ (60°)

$-\frac{23\pi}{3} \leftrightarrow \frac{\pi}{3}$ so $\cos\left(-\frac{23\pi}{3}\right) = \frac{1}{2} = \cos(\pi/3)$

coterm

c) $\tan\left(-\frac{17\pi}{4}\right) = -\frac{17\pi}{4} + 4\pi = \left(-\frac{17}{4} + \frac{16}{4}\right)\pi = -\frac{\pi}{4}$ (−45°)

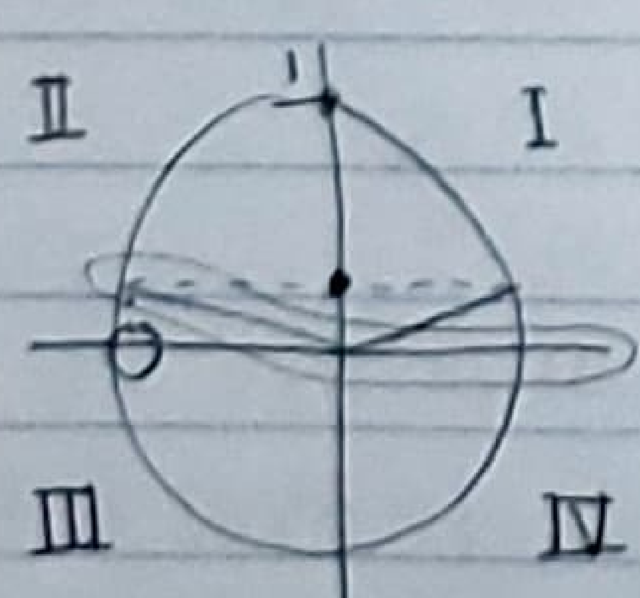
$\tan = \frac{\sin\theta}{\cos\theta}$ $-\frac{\pi}{4} \leftrightarrow \frac{\pi}{4}$ $\to \tan\left(-\frac{\pi}{4}\right) = -\tan(\pi/4) =$

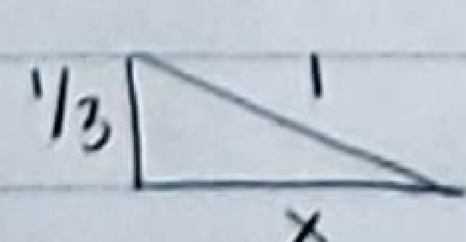
$\to \frac{1/\sqrt{2}}{1/\sqrt{2}} = 1$

negative angle identity $\tan\left(-\frac{17\pi}{4}\right) = -1$

HW example:

find $\cos\theta$ if $\sin\theta = \frac{1}{3}$ and θ is in QII





$x^2 + \frac{1}{3}^2 = 1$

$x^2 = 1 - 1/9$

$x^2 = 8/9 \to \pm\sqrt{8/9} \to -\sqrt{8/9}$

since QII has −x values

$\boxed{\cos\theta = -\sqrt{8/9}}$