

KEY

Group Work 1.1-1.2
PCHA 2021-22 / Dr. Kessner

Name:

Partner(s):

You can use any class materials and discuss with your classmates, but no calculator and no other online resources.

1. Draw a unit circle and evaluate the following:

a) $\sin \frac{5\pi}{3} = -\frac{\sqrt{3}}{2}$

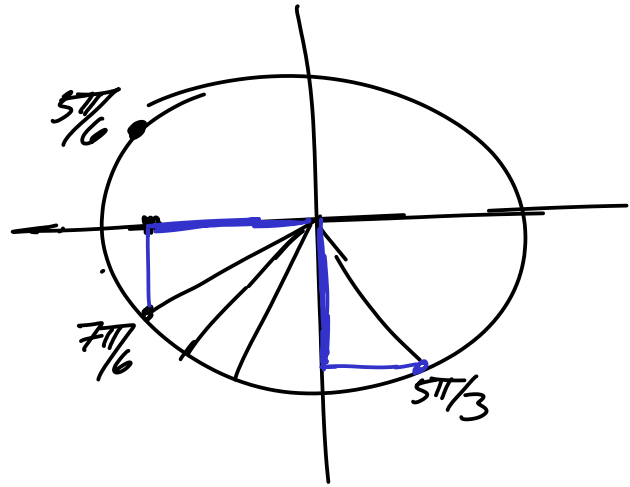
b) $\cos \frac{7\pi}{6} = -\frac{\sqrt{3}}{2}$

c) $\csc \frac{5\pi}{6} = \frac{1}{\sin \frac{5\pi}{6}} = 2$

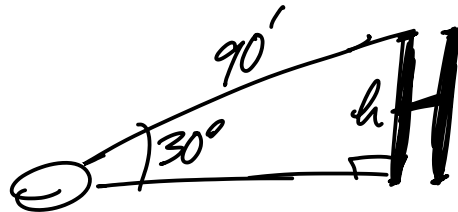
d) $\tan \frac{15\pi}{4} = \tan \frac{3\pi}{4} = -1$

e) $\sin \frac{99\pi}{2} = \sin \left(\frac{96\pi}{2} + \frac{3\pi}{2} \right) = -1$

f) $\sin \frac{97\pi}{2} = \sin \left(\frac{96\pi}{2} + \frac{\pi}{2} \right) = 1$



2. You fly a drone to measure the Hollywood Sign. The drone is hovering at the same altitude as the bottom of the letters. The drone has sensors showing that the angle of elevation to the top of the letter H is 30° , and the distance to the top of the same letter is $90'$. How tall are the letters?

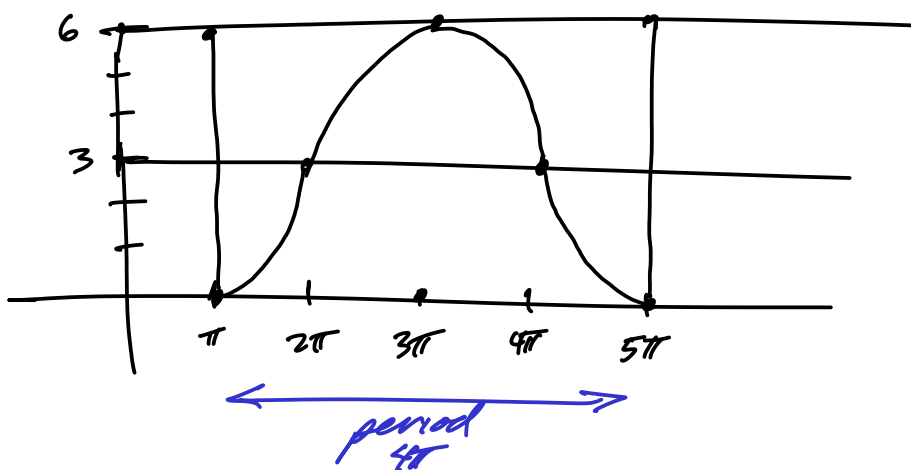


$$\begin{aligned}\sin 30^\circ &= \frac{h}{90'} \\ \Rightarrow \frac{1}{2} &= \frac{h}{90'} \\ \Rightarrow h &= 45'\end{aligned}$$

3. List the transformations required to obtain the function from a standard trig function. Write down the period and amplitude (if applicable). Graph the function. What are the domain and range?

a. $f(x) = -3 \cos\left(\frac{1}{2}(x - \pi)\right) + 3$

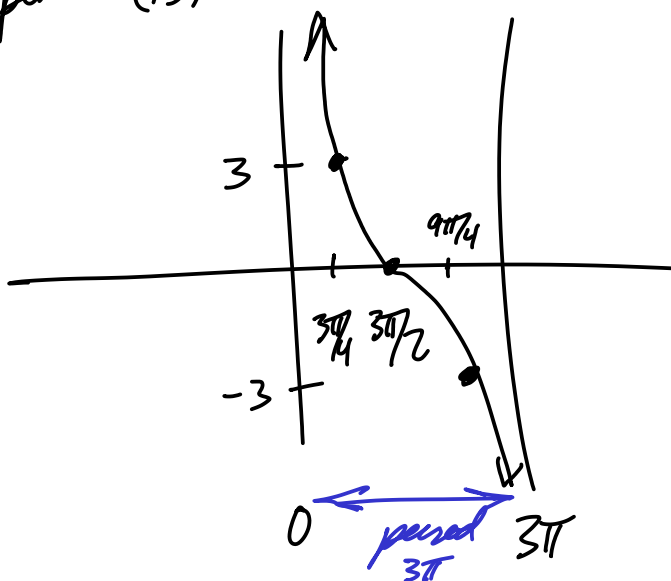
amplitude 3 (flipped)
 period $\frac{2\pi}{(\frac{1}{2})} = 4\pi$
 horizontal shift $+\pi$
 vertical shift $+3$



domain \mathbb{R}
 range $[0, 6]$

b. $g(x) = 3 \cot\left(\frac{x}{3}\right)$

vertical scale 3
 period $\frac{\pi}{(\frac{1}{3})} = 3\pi$



domain $x \neq 3\pi k$
 ($k \in \mathbb{Z}$)
 range \mathbb{R}