

**Unit 2 Group Work**  
**PCHA 2022-23 / Dr. Kessner**

**Name & Pledge:**

**No calculator! Have fun!**

**1. Evaluate the following:**

a)  $\tan \frac{7\pi}{6}$

b)  $\sec \frac{4\pi}{3}$

c)  $\cos\left(-\frac{7\pi}{6}\right)$

d)  $\cot \frac{99\pi}{4}$

e)  $\cos^{-1} \sin\left(-\frac{\pi}{6}\right)$

f)  $\sin^{-1} \cos\left(-\frac{\pi}{6}\right)$

**2.** Write down all the relevant properties (period, amplitude, shifts/scales, asymptotes) of the following trig functions, and then graph by hand.

$$f(x) = 3 \sec 2\pi x$$

$$g(x) = -3 \tan \pi x$$

**3.** Prove the identities:

$$(\sec \theta - \cos \theta)^2 + \sin^2 \theta = \tan^2 \theta$$

$$\frac{\sin \theta}{\sec \theta - \cos \theta} = \cot \theta$$

4. Use a sum formula to find  $\cos(195^\circ)$ .

Derive the following half angle formula from the relevant double angle formula:

$$\cos u = \pm \sqrt{\frac{1 + \cos 2u}{2}}$$

Use the half angle formula above to find  $\cos(195^\circ)$ .

5. Solve the following triangle:  $a = 10$ ,  $c = 10\sqrt{3}$ ,  $B = 30^\circ$ .

Solve the following triangle:  $a = 10$ ,  $b = 10$ ,  $C = 60^\circ$ .