

**Unit #3: Trigonometry****Topic:** Trigonometry Review**Objective:** SWBAT solve various problems using trigonometry.**NO CALCULATOR***Directions: Read each question carefully and show all work.***1) Determine the value of each of the following:**

a)  $\cos\left(-\frac{5\pi}{4}\right)$

b)  $\csc\left(\frac{2\pi}{3}\right)$

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

d)  $\tan\left(-\frac{5\pi}{3}\right)$

**2) What are the coordinates on the unit circle for each of the following angles?**

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

b)  $\frac{7\pi}{4}$

c)  $-\frac{5\pi}{6}$

d)  $\frac{11\pi}{4}$

**3) If an angle intersects the unit circle at the point  $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ , what is the value for the sine and cosine of the angle? What could be the measure of the angle?**

4) Simplify each of the following expressions for the given angle.

a)  $2\sin x \sec x (1 - 6\tan^2 x)$ ;  $x = \frac{2\pi}{3}$

b)  $\frac{\tan t - \tan \sin^2 t}{2\sin t \cos t}$ ;  $t = -\frac{3\pi}{4}$

c)  $\frac{\sec^2 t - 2\cos^2 t}{3\cos t - \sin t}$ ;  $t = \frac{13\pi}{6}$

5) Simplify each of the following:

a)  $\frac{\sec x}{\sin x} - \frac{\sin x}{\cos x}$

$$\text{b) } \frac{\sin x - \sin^3 x}{\cos^3 x \sin^3 x}$$

6) Prove each of the following:

$$\text{a) } \frac{1 - \sec^2 x}{\sec^2 x - 1} = \cot^2 x - \csc^2 x$$

$$\text{b) } \frac{\tan \theta \csc^2 \theta}{1 + \tan^2 \theta} = \cot \theta$$

7) Solve each of the following equations for  $x$ , where  $0 \leq x \leq 2\pi$ :

a)  $5\sqrt{3} - 10\sin x = 0$

b)  $3\sec^2 x - 1 = 5$

c)  $\tan x \cot x + \tan x = 0$

d)  $\csc^2 x - \csc x = 2$

e)  $2\cos^2 x + \cos x - 1 = 0$

f)  $5\sin^2 x - 3\sin x + 1 = \cos^2 x$

