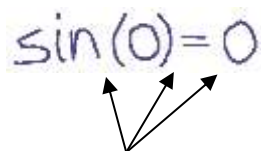


**SOLUTIONS: Worksheet 2**

1. Find the **exact** value for each of the following expressions. Be sure to use proper notation to communicate your answers, i.e., link the given expressions and your answers with equal signs. An example has been provided to clarify how your responses should be organized.

**example:** Evaluate  $\sin(0)$ .


$$\sin(0) = 0$$

You should write (or type) all of this to communicate what  $\sin(0)$  equals.

- a. Evaluate  $\cos\left(\frac{\pi}{3}\right)$ .

$$\cos\left(\frac{\pi}{3}\right) = \frac{1}{2}$$

- b. Evaluate  $\sin\left(\frac{5\pi}{6}\right)$ .

$$\sin\left(\frac{5\pi}{6}\right) = \frac{1}{2}$$

- c. Evaluate  $\cos(210^\circ)$ .

$$\cos(210^\circ) = -\frac{\sqrt{3}}{2}$$

d. Evaluate  $\sin\left(\frac{5\pi}{3}\right)$ .

$$\sin\left(\frac{5\pi}{3}\right) = -\frac{\sqrt{3}}{2}$$

e. Evaluate  $\cos\left(\frac{3\pi}{4}\right)$ .

$$\cos\left(\frac{3\pi}{4}\right) = -\frac{\sqrt{2}}{2}$$

f. Evaluate  $\csc(60^\circ)$ .

$$\begin{aligned}\csc(60^\circ) &= \frac{1}{\sin(60^\circ)} \\ &= \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}\end{aligned}$$

g. Evaluate  $\sec\left(\frac{11\pi}{6}\right)$ .

$$\begin{aligned}\sec\left(\frac{11\pi}{6}\right) &= \frac{1}{\cos\left(\frac{11\pi}{6}\right)} \\ &= \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}\end{aligned}$$

h. Evaluate  $\tan\left(\frac{5\pi}{4}\right)$ .

$$\begin{aligned}\tan\left(\frac{5\pi}{4}\right) &= \frac{\sin\left(\frac{5\pi}{4}\right)}{\cos\left(\frac{5\pi}{4}\right)} \\ &= \frac{-\frac{\sqrt{2}}{2}}{-\frac{\sqrt{2}}{2}} \\ &= 1\end{aligned}$$

2. If  $\sin(A) = \frac{5}{6}$  and  $\frac{\pi}{2} < A < \pi$  (i.e., angle  $A$  is in the second quadrant), find the following **without using any inverse functions**. (Provide **exact**, completely simplified numerical answers; as shown above in the example in #1, use proper notation to **directly communicate** what the given expressions equal.)

a.  $\cos(A)$ .

To find  $\cos(A)$  values we can use the Pythagorean Identity:  $\sin^2(A) + \cos^2(A) = 1$ :

$$\begin{aligned}
 \sin^2(A) + \cos^2(A) &= 1 \\
 \Rightarrow \left(\frac{5}{6}\right)^2 + \cos^2(A) &= 1 \\
 \Rightarrow \frac{25}{36} + \cos^2(A) &= 1 \\
 \Rightarrow \cos^2(A) &= 1 - \frac{25}{36} \\
 \Rightarrow \cos^2(A) &= \frac{11}{36} \\
 \Rightarrow \cos(A) &= -\sqrt{\frac{11}{36}} \quad (\text{we take negative square root since } A \text{ is in the 2}^{\text{nd}} \text{ quadrant}) \\
 \Rightarrow \cos(A) &= -\frac{\sqrt{11}}{6}
 \end{aligned}$$

b.  $\tan(A)$ .

$$\begin{aligned}
 \tan(A) &= \frac{\sin(A)}{\cos(A)} \\
 &= \frac{\frac{5}{6}}{-\frac{\sqrt{11}}{6}} \\
 &= -\frac{5}{\sqrt{11}} = -\frac{5\sqrt{11}}{11}
 \end{aligned}$$

a.  $\csc(A)$ .

$$\begin{aligned}
 \csc(A) &= \frac{1}{\sin(A)} \\
 &= \frac{1}{\frac{5}{6}} \\
 &= \frac{6}{5}
 \end{aligned}$$