

## Review Exercise Set 2

Exercise 1: Use the unit circle to find the value of the given trigonometric expression.

$$\sin \frac{5\pi}{6}$$

Exercise 2: Given the values for  $\sin x$  and  $\cos x$  use the trigonometric identities to find the other trigonometric functions (  $\tan x$ ,  $\cot x$ ,  $\sec x$ ,  $\csc x$  ).

$$\sin x = \frac{\sqrt{11}}{4} \text{ and } \cos x = \frac{\sqrt{5}}{4}$$

Exercise 3: Given the values for  $\sin x$  and  $\cos x$  use the trigonometric identities to find the other trigonometric functions (  $\tan x$ ,  $\cot x$ ,  $\sec x$ ,  $\csc x$  ).

$$\sin x = \frac{5}{\sqrt{194}} \text{ and } \cos x = \frac{13}{\sqrt{194}}$$

Exercise 4: Using the periodic properties of trigonometric functions, find the exact value of the given trigonometric expression.

$$\cot \frac{9\pi}{4}$$

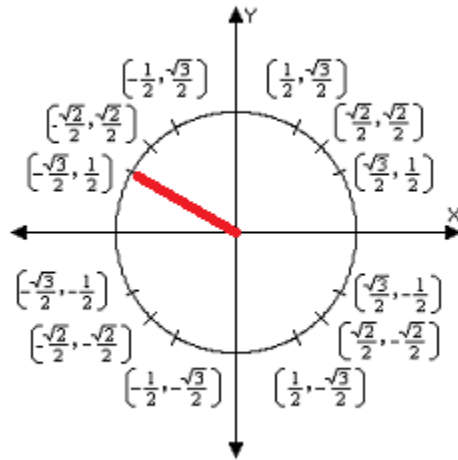
Exercise 5: Using the periodic properties of trigonometric functions, find the exact value of the given trigonometric expression.

$$\csc \frac{22\pi}{3}$$

## Review Exercise Set 2 Answer Key

Exercise 1: Use the unit circle to find the value of the given trigonometric expression.

$$\sin \frac{5\pi}{6}$$



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

Exercise 2: Given the values for  $\sin x$  and  $\cos x$  use the trigonometric identities to find the other trigonometric functions ( $\tan x$ ,  $\cot x$ ,  $\sec x$ ,  $\csc x$ ).

$$\sin x = \frac{\sqrt{11}}{4} \quad \text{and} \quad \cos x = \frac{\sqrt{5}}{4}$$

$$\begin{aligned} \tan x &= \frac{\sin x}{\cos x} \\ &= \frac{\frac{\sqrt{11}}{4}}{\frac{\sqrt{5}}{4}} \\ &= \frac{\sqrt{11}}{4} \times \frac{4}{\sqrt{5}} \\ &= \frac{\sqrt{11}}{\sqrt{5}} \\ &= \frac{\sqrt{11}}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} \\ &= \frac{\sqrt{55}}{5} \end{aligned}$$

$$\begin{aligned} \cot x &= \frac{1}{\tan x} \\ &= \frac{1}{\frac{\sqrt{55}}{5}} \\ &= \frac{5}{\sqrt{55}} \\ &= \frac{5}{\sqrt{55}} \times \frac{\sqrt{55}}{\sqrt{55}} \\ &= \frac{5\sqrt{55}}{55} \\ &= \frac{\sqrt{55}}{11} \end{aligned}$$

Exercise 2 (Continued):

$$\begin{aligned}\sec x &= \frac{1}{\cos x} \\ &= \frac{1}{\frac{\sqrt{5}}{4}} \\ &= \frac{4}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} \\ &= \frac{4\sqrt{5}}{5}\end{aligned}$$

$$\begin{aligned}\csc x &= \frac{1}{\sin x} \\ &= \frac{1}{\frac{\sqrt{11}}{4}} \\ &= \frac{4}{\sqrt{11}} \times \frac{\sqrt{11}}{\sqrt{11}} \\ &= \frac{4\sqrt{11}}{11}\end{aligned}$$

Exercise 3: Given the values for  $\sin x$  and  $\cos x$  use the trigonometric identities to find the other trigonometric functions ( $\tan x$ ,  $\cot x$ ,  $\sec x$ ,  $\csc x$ ).

$$\sin x = \frac{5}{\sqrt{194}} \text{ and } \cos x = \frac{13}{\sqrt{194}}$$

$$\begin{aligned}\tan x &= \frac{\sin x}{\cos x} \\ &= \frac{\frac{5}{\sqrt{194}}}{\frac{13}{\sqrt{194}}} \\ &= \frac{5}{\sqrt{194}} \times \frac{\sqrt{194}}{13} \\ &= \frac{5}{13}\end{aligned}$$

$$\begin{aligned}\cot x &= \frac{1}{\tan x} \\ &= \frac{1}{\frac{5}{13}} \\ &= \frac{13}{5}\end{aligned}$$

$$\begin{aligned}\sec x &= \frac{1}{\cos x} \\ &= \frac{1}{\frac{13}{\sqrt{194}}} \\ &= \frac{\sqrt{194}}{13}\end{aligned}$$

$$\begin{aligned}\csc x &= \frac{1}{\sin x} \\ &= \frac{1}{\frac{5}{\sqrt{194}}} \\ &= \frac{\sqrt{194}}{5}\end{aligned}$$

Exercise 4: Using the periodic properties of trigonometric functions, find the exact value of the given trigonometric expression.

$$\cot \frac{9\pi}{4}$$

$$\begin{aligned}\cot \frac{9\pi}{4} &= \cot \frac{\pi + 8\pi}{4} \\ &= \cot \left( \frac{\pi}{4} + \frac{8\pi}{4} \right) \\ &= \cot \left( \frac{\pi}{4} + 2\pi \right) \\ &= \cot \frac{\pi}{4} \\ &= \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} \\ &= 1\end{aligned}$$

Exercise 5: Using the periodic properties of trigonometric functions, find the exact value of the given trigonometric expression.

$$\csc \frac{22\pi}{3}$$

$$\begin{aligned}\csc \frac{22\pi}{3} &= \csc \frac{4\pi + 18\pi}{3} \\ &= \csc \left( \frac{4\pi}{3} + \frac{18\pi}{3} \right) \\ &= \csc \left( \frac{4\pi}{3} + 6\pi \right) \\ &= \csc \frac{4\pi}{3} \\ &= \frac{1}{-\frac{\sqrt{3}}{2}} \\ &= -\frac{2}{\sqrt{3}} \\ &= -\frac{2}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} \\ &= -\frac{2\sqrt{3}}{3}\end{aligned}$$