

## Fundamental Trig Identities

Use identities to find the value of each expression.

1) If  $\sin \theta = -0.93$ , find  $\cos \left( \theta - \frac{\pi}{2} \right)$ .

2) If  $\tan (-\theta) = -1.48$ , find  $\cot \left( \frac{\pi}{2} - \theta \right)$ .

3) If  $\cos \left( \theta - \frac{\pi}{2} \right) = -0.52$ , find  $\sin \theta$ .

4) If  $\sin \theta = 0.16$ , find  $\cos \left( \frac{\pi}{2} - \theta \right)$ .

5) If  $\sec \theta = 4.45$ , find  $\csc \left( \frac{\pi}{2} - \theta \right)$ .

6) If  $\sin \left( \theta - \frac{\pi}{2} \right) = -0.22$ , find  $\cos (-\theta)$ .

7) If  $\tan \theta = -0.87$ , find  $\cot \left( \frac{\pi}{2} - \theta \right)$ .

8) If  $\csc \left( \frac{\pi}{2} - \theta \right) = -1.11$ , find  $\sec (-\theta)$ .

9) Find  $\sin \theta$  and  $\sec \theta$   
if  $\tan \theta = 3$  and  $\cos \theta < 0$ .

10) Find  $\csc \theta$  and  $\sin \theta$   
if  $\tan \theta = \frac{7}{4}$  and  $\sin \theta < 0$ .

11) Find  $\cos \theta$  and  $\csc \theta$   
if  $\tan \theta = -\frac{3}{2}$  and  $\sin \theta < 0$ .

12) Find  $\csc \theta$  and  $\sec \theta$   
if  $\cot \theta = \frac{3}{2}$  and  $\cos \theta > 0$ .

13) Find  $\cot \theta$  and  $\cos \theta$   
if  $\csc \theta = \frac{5}{2}$  and  $\cos \theta < 0$ .

14) Find  $\cos \theta$  and  $\sec \theta$   
if  $\sin \theta = -\frac{1}{4}$  and  $\cos \theta < 0$ .

15) Find  $\csc \theta$  and  $\sin \theta$   
if  $\tan \theta = -\frac{2}{3}$  and  $\csc \theta < 0$ .

16) Find  $\cos \theta$  and  $\sec \theta$   
if  $\cot \theta = -\frac{1}{2}$  and  $\cos \theta > 0$ .

**Verify each identity.**

17)  $\sin x \sec x = \tan x$

18)  $\frac{1}{\sin x \cot x} = \frac{1}{\cos x}$

19)  $\sec^2 x - \csc^2 x = \tan^2 x - \cot^2 x$

20)  $\csc^2 x \cos^2 x = \csc^2 x - 1$

## Fundamental Trig Identities

Use identities to find the value of each expression.

1) If  $\sin \theta = -0.93$ , find  $\cos \left( \theta - \frac{\pi}{2} \right)$ .

 $-0.93$ 

2) If  $\tan(-\theta) = -1.48$ , find  $\cot \left( \frac{\pi}{2} - \theta \right)$ .

 $1.48$ 

3) If  $\cos \left( \theta - \frac{\pi}{2} \right) = -0.52$ , find  $\sin \theta$ .

 $-0.52$ 

4) If  $\sin \theta = 0.16$ , find  $\cos \left( \frac{\pi}{2} - \theta \right)$ .

 $0.16$ 

5) If  $\sec \theta = 4.45$ , find  $\csc \left( \frac{\pi}{2} - \theta \right)$ .

 $4.45$ 

6) If  $\sin \left( \theta - \frac{\pi}{2} \right) = -0.22$ , find  $\cos(-\theta)$ .

 $0.22$ 

7) If  $\tan \theta = -0.87$ , find  $\cot \left( \frac{\pi}{2} - \theta \right)$ .

 $-0.87$ 

8) If  $\csc \left( \frac{\pi}{2} - \theta \right) = -1.11$ , find  $\sec(-\theta)$ .

 $-1.11$ 

9) Find  $\sin \theta$  and  $\sec \theta$   
if  $\tan \theta = 3$  and  $\cos \theta < 0$ .

 $-\frac{3\sqrt{10}}{10}$  and  $-\sqrt{10}$ 

10) Find  $\csc \theta$  and  $\sin \theta$   
if  $\tan \theta = \frac{7}{4}$  and  $\sin \theta < 0$ .

 $-\frac{\sqrt{65}}{7}$  and  $-\frac{7\sqrt{65}}{65}$ 

11) Find  $\cos \theta$  and  $\csc \theta$   
if  $\tan \theta = -\frac{3}{2}$  and  $\sin \theta < 0$ .

 $\frac{2\sqrt{13}}{13}$  and  $-\frac{\sqrt{13}}{3}$ 

12) Find  $\csc \theta$  and  $\sec \theta$   
if  $\cot \theta = \frac{3}{2}$  and  $\cos \theta > 0$ .

 $\frac{\sqrt{13}}{2}$  and  $\frac{\sqrt{13}}{3}$ 

13) Find  $\cot \theta$  and  $\cos \theta$   
if  $\csc \theta = \frac{5}{2}$  and  $\cos \theta < 0$ .

 $-\frac{\sqrt{21}}{2}$  and  $-\frac{\sqrt{21}}{5}$ 

14) Find  $\cos \theta$  and  $\sec \theta$   
if  $\sin \theta = -\frac{1}{4}$  and  $\cos \theta < 0$ .

 $-\frac{\sqrt{15}}{4}$  and  $-\frac{4\sqrt{15}}{15}$ 

15) Find  $\csc \theta$  and  $\sin \theta$   
if  $\tan \theta = -\frac{2}{3}$  and  $\csc \theta < 0$ .

 $-\frac{\sqrt{13}}{2}$  and  $-\frac{2\sqrt{13}}{13}$ 

16) Find  $\cos \theta$  and  $\sec \theta$   
if  $\cot \theta = -\frac{1}{2}$  and  $\cos \theta > 0$ .

 $\frac{\sqrt{5}}{5}$  and  $\sqrt{5}$

Verify each identity.

17)  $\sin x \sec x = \tan x$

$\sin x \sec x$       Use  $\sec x = \frac{1}{\cos x}$

$\frac{\sin x}{\cos x}$       Use  $\tan x = \frac{\sin x}{\cos x}$

$\tan x$       ■

18)  $\frac{1}{\sin x \cot x} = \frac{1}{\cos x}$

$\frac{1}{\sin x \cot x}$       Use  $\cot x = \frac{\cos x}{\sin x}$

$\frac{\sin x}{\sin x \cos x}$       Cancel common factors

$\frac{1}{\cos x}$       ■

19)  $\sec^2 x - \csc^2 x = \tan^2 x - \cot^2 x$

$\sec^2 x - \csc^2 x$       Use  $\cot^2 x + 1 = \csc^2 x$

$\sec^2 x - \cot^2 x - 1$       Use  $\tan^2 x + 1 = \sec^2 x$

$\tan^2 x - \cot^2 x$       ■

20)  $\csc^2 x \cos^2 x = \csc^2 x - 1$

$\csc^2 x \cos^2 x$       Use  $\csc x = \frac{1}{\sin x}$

$\frac{\cos^2 x}{\sin^2 x}$       Use  $\cot x = \frac{\cos x}{\sin x}$

$\cot^2 x$       Use  $\cot^2 x + 1 = \csc^2 x$

$\csc^2 x - 1$       ■