

Fundamental Trig Identities

Date _____ Period _____

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

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

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

$$\tan x \quad \blacksquare$$

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

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

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

$$\frac{1}{\cos x} \quad \blacksquare$$

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

$$\sec^2 x - \csc^2 x \quad \text{Use } \cot^2 x + 1 = \csc^2 x$$

$$\sec^2 x - \cot^2 x - 1 \quad \text{Use } \tan^2 x + 1 = \sec^2 x$$

$$\tan^2 x - \cot^2 x \quad \blacksquare$$

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

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

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

$$\cot^2 x \quad \text{Use } \cot^2 x + 1 = \csc^2 x$$

$$\csc^2 x - 1 \quad \blacksquare$$