

Find exact value
1) $\cos 285^\circ$

Verify each identity.
2) $1 + \cos 2x + \cot^2 x + \sin^2 x = \cos^2 x + \csc^2 x$

If $\csc x = 7/4$ find $\sin x$

$$\sin x = \frac{1}{\csc x}$$

$$= \frac{1}{7/4}$$

$$= \frac{4}{7}$$

if $\cot x = \frac{2}{5\sqrt{3}}$ and $\sin x = \frac{\sqrt{5}}{3}$ find $\cos x$

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

$$\frac{2}{5\sqrt{3}} = \frac{\cos x}{\frac{\sqrt{5}}{3}}$$

$$\frac{2}{5\sqrt{3}} \cdot \frac{3}{\sqrt{5}} = \frac{\cos x}{1}$$

$$\frac{2}{15} = \cos x$$

If $\tan X = -8$ and $\sin X > 0$, find $\sin X$ and $\cos X$, algebraically.

$$\tan^2 x + 1 = \sec^2 x$$

$$(-8)^2 + 1 = \sec^2 x$$

$$64 + 1 = \sec^2 x$$

$$\sqrt{65} = \sec x$$

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

$$= \frac{1}{\sqrt{65}}$$

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

$$\frac{-1}{\sqrt{65}} = \frac{\sin x}{\frac{1}{\sqrt{65}}}$$

$$\frac{-1}{\sqrt{65}} \cdot \frac{\sqrt{65}}{\sqrt{65}} = \frac{\sin x \cdot \sqrt{65}}{\sqrt{65}}$$

$$\frac{-1}{\sqrt{65}} = \frac{\sin x \cdot \sqrt{65}}{\sqrt{65}}$$

$$\frac{-1}{\sqrt{65}} = \sin x$$

$$\frac{1}{\sqrt{65}} = \sin x$$

$$\frac{1}{\sqrt{65}} = \sin x$$

If $\cot X = -3$ and $\cos X < 0$ find $\csc X$ and $\tan X$, algebraically

$$\tan x = \frac{1}{\cot x}$$

$$= \frac{1}{-3}$$

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

$$1 + (-3)^2 = \csc^2 x$$

$$1 + 9 = \csc^2 x$$

$$\sqrt{10} = \csc x$$

If $\tan \theta = 1.28$ Find $\cot(\theta - \frac{\pi}{2})$

$$\tan \theta = \cot(\frac{\pi}{2} - \theta)$$

$$= \cot(-(-\frac{\pi}{2} + \theta))$$

$$1.28 = -\cot(\theta - \frac{\pi}{2})$$

$$-1.28 = \cot(\theta - \frac{\pi}{2})$$

Review worksheet

$$\begin{aligned}
 1) \tan \frac{11\pi}{8} &= \tan\left(\frac{11\pi}{8}\right) & 2) \sin \frac{15\pi}{8} \\
 &= \sqrt{\frac{1-\cos \frac{11\pi}{4}}{1+\cos \frac{11\pi}{4}}} & \\
 &= \sqrt{\frac{1+\frac{\sqrt{2}}{2}}{1-\frac{\sqrt{2}}{2}}} & \\
 &= \sqrt{\frac{\frac{2+\sqrt{2}}{2}}{\frac{2-\sqrt{2}}{2}}} & \\
 &= \sqrt{\frac{2+\sqrt{2}}{2-\sqrt{2}} \cdot \frac{2+\sqrt{2}}{2+\sqrt{2}}} & \\
 &= \sqrt{\frac{4+4\sqrt{2}+2}{4-2}} & \\
 &= \sqrt{\frac{6+4\sqrt{2}}{2}} & \\
 &= \sqrt{3+2\sqrt{2}} &
 \end{aligned}$$