Find the exact value of the following.

$\sin^{-1}\left(\frac{1}{2}\right)$ $\tan^{-1}(-1)$ $\sec^{-1}(-2)$ $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

Use Sum/Difference, Double/Half-Angles formulas to find the exact value of the following.

$\sin 105°$ $\tan\left(\frac{7\pi}{12}\right)$ $\cos\left(\frac{\pi}{12}\right)$ $\sin(22.5°)$

$\cos\left(-\frac{\pi}{8}\right)$ $\cos\left(\frac{5\pi}{12}\right)\cos\left(\frac{7\pi}{12}\right) - \sin\left(\frac{5\pi}{12}\right)\sin\left(\frac{7\pi}{12}\right)$

Verify the identity.

$$\frac{\sec x - \cos x}{\sec x} = \sin^2 x$$

$$-\sin x = \sin\left(\frac{\pi}{3} - x\right) - \sin\left(\frac{\pi}{3} + x\right)$$

Solve the following. Leave your answer in the general solution form.

$$\sin(2\theta) = \cos(\theta)$$
$$\tan\beta = 3\cot\beta$$

If $\sec x = \dfrac{3}{2}$ and is in the fourth quadrant, find $\sin(2x), \cos(2x), \tan(2x)$.

Sketch a triangle with an acute angle θ, and $\csc\theta = \dfrac{41}{40}$. Find the other 5 trigonometric ratios of θ.

A 12 ft ladder leans against a building so that the angle between the ground and the ladder is 72°. How high does the ladder reach on the building? Leave your answer exact, and sketch a drawing illustrating the situation.

A 39 ft tree casts a shadow that is 26 ft long. What is the angle of elevation to the sun? Leave your answer exact, and sketch a drawing.