

Math 4  
4-4 and 4-5 Learning Check

Name Key

Prove each of the following:

1.  $\sec x \cdot \sin x = \tan x$

$$\frac{1}{\cos x} \cdot \sin x =$$

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

$$\tan x = \tan x$$

2.  $\frac{\cos x + \tan x}{\sin x} = \sec x + \cot x$

$$\frac{\cos x}{\sin x} + \frac{\frac{\sin x}{\cos x}}{\sin x}$$

$$\cot x + \frac{\cancel{\sin x}}{\cos x} \cdot \frac{1}{\cancel{\sin x}}$$

$$\cot x + \sec x = \cot x + \sec x$$

3.  $\sin x \tan x + \cos x = \sec x$

$$\frac{\sin x}{1} \cdot \frac{\sin x}{\cos x} + \frac{\cos x}{1} =$$

$$\frac{\sin^2 x}{\cos x} + \frac{\cos x}{1} \left( \frac{\cos x}{\cos x} \right) =$$

$$\frac{\sin^2 x + \cos^2 x}{\cos x} =$$

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

$$\sec x = \sec x$$

4.  $\sec^2 x \sin^2 x + (\sin x + \cos x)^2 - \sec^2 x = 2 \sin x \cos x$

$$\frac{1}{\cos^2 x} \cdot \sin^2 x + \sin^2 x + 2 \sin x \cos x + \cos^2 x - \sec^2 x =$$

$$\tan^2 x + 1 + 2 \sin x \cos x - \sec^2 x =$$

$$\sec^2 x + 2 \sin x \cos x - \sec^2 x =$$

$$2 \sin x \cos x = 2 \sin x \cos x$$

Solve for Primary Values

1.  $\sin x = \frac{\sqrt{3}}{2}$

$$x = \frac{\pi}{3}, \frac{2\pi}{3}$$

2.  $2\cos^2 x - 3\cos x + 1 = 0$

$$(2\cos x - 1)(\cos x - 1) = 0$$

$$\cos x = \frac{1}{2} \quad \left\{ \begin{array}{l} \cos x = 1 \end{array} \right.$$

$$x = \frac{\pi}{3}, \frac{5\pi}{3}$$

$$x = 0, 2\pi$$

3.  $-2\cos^2 x - 5\sin x + 4 = 0$

$$-2(1 - \sin^2 x) - 5\sin x + 4 = 0$$

$$-2 + 2\sin^2 x - 5\sin x + 4 = 0$$

$$2\sin^2 x - 5\sin x + 2 = 0$$

$$(2\sin x - 1)(\sin x - 2) = 0$$

$$\sin x = \frac{1}{2}$$

$$\sin x = 2$$

$$x = \frac{\pi}{6}, \frac{5\pi}{6}$$

No solution