

## 7.1 Trig Identities

### A few Algebraic Identities

Ex  $x + 3x = 4x$

$$x^2 - y^2 = (x+y)(x-y)$$

$$a^2 + b^2 = c^2$$

### A few trig identities

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

$$\sin \theta = \frac{y}{1} \rightarrow \csc \theta = \frac{1}{y}$$

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

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

$$\sin(-A) = -\sin(A)$$

$$\cos(-A) = \cos(A)$$

Ex  $\frac{\sec \theta}{\tan \theta} = \sin \theta$

$\frac{1}{\cos \theta} \rightarrow \frac{\sin \theta}{\cos \theta}$

$$\frac{\sec 45^\circ}{\tan 45^\circ} = \sin 45^\circ$$

$$\frac{\frac{1}{\frac{\sqrt{2}}{2}}}{1} = \frac{\sqrt{2}}{2}$$

$$\frac{2}{\sqrt{2}} \neq \frac{\sqrt{2}}{2}$$

#20  $\frac{1}{\cos^2 x} \rightarrow \sec^2 x - 1 = \frac{\cos x}{\csc x} \leftarrow \frac{1}{\sin x}$

$$\sec^2 30^\circ - 1 = \frac{\cos 30^\circ}{\csc 30^\circ}$$

$$\left(\frac{1}{\frac{\sqrt{3}}{2}}\right)^2 - 1 = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{\frac{1}{2}}} \rightarrow \begin{matrix} 1 \div \frac{1}{2} \\ 1 \cdot \frac{2}{1} \end{matrix}$$

$$\left(\frac{2}{\sqrt{3}}\right)^2 - 1 = \frac{\sqrt{3}}{2} \rightarrow \begin{matrix} \frac{\sqrt{3}}{2} \div 2 \\ \frac{1}{2} \end{matrix}$$

$$\frac{4}{3} - 1 \neq \frac{\sqrt{3}}{4}$$