

6.3 Trig Identities

$$\tan \theta = \sin \theta / \cos \theta \qquad \cot \theta = \cos \theta / \sin \theta$$

$$\csc \theta = 1 / \sin \theta \qquad \sec \theta = 1 / \cos \theta \qquad \cot \theta = 1 / \tan \theta$$

$$\sin^2 \theta + \cos^2 \theta = 1 \qquad \tan^2 \theta + 1 = \sec^2 \theta \qquad 1 + \cot^2 \theta = \csc^2 \theta$$

Even-Odd properties:

$$\sin(-\theta) = -\sin \theta \qquad \cos(-\theta) = \cos \theta \qquad \tan(-\theta) = -\tan \theta$$

$$\csc(-\theta) = -\csc \theta \qquad \sec(-\theta) = \sec \theta \qquad \cot(-\theta) = -\cot \theta$$

These form the basic trig identities.....these need to be know not just memorized.

You may have to use variations of these....for example you may need:

$$\sin^2 \theta = 1 - \cos^2 \theta \text{ which would come from } \sin^2 \theta + \cos^2 \theta = 1.$$

When establishing an identity start by working only on one side of the equation (usually the side containing the more complicated expression).

Ex. 1 Establish identity: $\csc \theta \times \tan \theta = \sec \theta$

Ex. 2 Establish identity: $\sin^2(-\theta) + \cos^2(-\theta) = 1$

Ex. 3 Establish identity: $1 + \tan \theta / 1 + \cot \theta = \tan \theta$

Ex. 4 Establish identity: $(\sin \theta / 1 + \cos \theta) + (1 + \cos \theta / \sin \theta) = 2 \csc \theta$