

Take Up 6.4 # 9

$$\sec^6 x - \tan^6 x = 1 + 3 \tan^2 x \sec^2 x$$

MHF 4UI UNIT 6

Trigonometric Functions II

Day 3 - Trig Identities (Part III)

Double Angle Formulas



Double Angle Identities

Identity

Proof

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

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

$$= 1 - 2\sin^2 x$$

$$= 2\cos^2 x - 1$$

$$\tan 2x = \frac{2\tan x}{1 - \tan^2 x}$$

Example 1: If $\sin x = \frac{4}{5}$, $\frac{\pi}{2} < x < \pi$ find the value of $\sin 2x$

Example 2: If $\cos a = \frac{2}{3}$ find $\cos 4a$

Example 3: Evaluate $\sin \frac{\pi}{8}$

Example 4: If $\tan x = \frac{4}{3}$, $\pi < x < 2\pi$ find the value of $\tan \frac{x}{2}$

Example 5: (# 36) Prove: $\frac{\sin 2x}{1 + \cos 2x} \bullet \frac{\cos x}{1 + \cos x} = \tan\left(\frac{x}{2}\right)$