Class Discussion

Unit 5 Topic 5 Part 2 Sum to Product and Product to Sum Formulas

Objective: Students need to be able to apply these formula to solve trigonometric equations or manipulate trigonometric expressions.

Sum To Product:	Product To Sum:
$\sin x+\sin y=2\sin\left(\frac{x+y}{2}\right)\cos\left(\frac{x-y}{2}\right)$	$\sin x\sin y=-\frac{1}{2}\left[\cos(x+y)-\cos(x-y)\right]$
$\sin x-\sin y=2\cos\left(\frac{x+y}{2}\right)\sin\left(\frac{x-y}{2}\right)$	$\cos x\cos y=\frac{1}{2}\left[\cos(x+y)+\cos(x-y)\right]$
$\cos x+\cos y=2\cos\left(\frac{x+y}{2}\right)\cos\left(\frac{x-y}{2}\right)$	$\sin x\cos y=\frac{1}{2}\left[\sin(x+y)+\sin(x-y)\right]$
$\cos x-\cos y=-2\sin\left(\frac{x+y}{2}\right)\sin\left(\frac{x-y}{2}\right)$	$\cos x\sin y=\frac{1}{2}\left[\sin(x+y)-\sin(x-y)\right]$

Ex 1: Solve $\sin 6x+\sin 2x=\sin 4x$ if $x\in[0,2\pi)$

Ex 2: Solve $\frac{\sqrt{3}\sin x}{\cos 4x-\cos 2x}+1=0$ if $x\in[0,2\pi)$

Ex 3: Write the following expression of product into sum: $\cos x\cos 3x\cos 5x$

Ex 4: Solve $\frac{\sqrt{3}\sin 3x}{\cos 4x-\cos 2x}+1=0$