Product to Sum Formulas

Addition

$$\cos(\alpha - \beta) + \cos(\alpha + \beta) = 2\cos\alpha\cos\beta$$

Subtraction

$$\sin(\alpha + \beta) - \sin(\alpha - \beta) = 2\cos\alpha\sin\beta$$

Sum to Product Formula

$$\sin\alpha + \sin\beta =$$

$$\cos\alpha + \cos\beta =$$

Find the exact value

- $\sin(195°) * \cos(75°)$

- $\sin(75°) + \sin(15°)$

- $\cos(255°) - \cos(195°)$

- $\cos(285°) * \cos(195°)$

Turn the product into a sum containing only sines or cosines

- $\cos(4\theta)\cos(2\theta)$

- $\sin(4\theta)\cos(2\theta)$

- $\sin\left(\dfrac{\theta}{2}\right)\cos\left(\dfrac{5\theta}{2}\right)$

- $\sin(\theta)\sin(2\theta)$

- $\cos(3\theta)\cos(5\theta)$

- $\sin\left(\dfrac{3\theta}{2}\right)\cos\left(\dfrac{\theta}{2}\right)$

Establish each Identity

- $\dfrac{\cos\theta - \cos(3\theta)}{\sin\theta + \sin(3\theta)} = \tan\theta$

- $\dfrac{\cos(4\theta) - \cos(8\theta)}{\cos(4\theta) + \cos(8\theta)} = \tan(2\theta)\tan(6\theta)$