Product-to-Sum and Sum-to-Product Formulas

Example #14 **Write as a sum:** $\sin 5\theta \cos 3\theta$

Example #15 **Write as a product:** $\cos 6x + \cos 2x$

Example #16 **Write as a product:** $\cos(\phi + 2\pi) + \cos\phi$

Example #17 **Rewrite the product as a sum or a difference:** $4\sin\left(\frac{\pi}{3}\right)\cos\left(\frac{5\pi}{6}\right)$

Mixed Practice

Example #18 **Verify:** $\cos^2 2x - \sin^2 2x = \cos 4x$

Example #19 **Verify:** $1 + \cos 10y = 2\cos^2 5y$

Example #20 **Verify:** $\dfrac{\cos 4x + \cos 2x}{\sin 4x + \sin 2x} = \cot 3x$