Precalculus

5-07 Product-to-Sum Formulas

Product-to-Sum Formulas

- $\sin u \sin v = \frac{1}{2}(\cos(u - v) - \cos(u + v))$
- $\cos u \cos v = \frac{1}{2}(\cos(u - v) + \cos(u + v))$
- $\sin u \cos v = \frac{1}{2}(\sin(u + v) + \sin(u - v))$
- $\cos u \sin v = \frac{1}{2}(\sin(u + v) - \sin(u - v))$

Rewrite $\sin 5\theta \cos 3\theta$ as a sum or difference.

Sum-to-Product Formulas

- $\sin u + \sin v = 2 \sin\left(\frac{u+v}{2}\right) \cos\left(\frac{u-v}{2}\right)$
- $\sin u - \sin v = 2 \cos\left(\frac{u+v}{2}\right) \sin\left(\frac{u-v}{2}\right)$
- $\cos u + \cos v = 2 \cos\left(\frac{u+v}{2}\right) \cos\left(\frac{u-v}{2}\right)$
- $\cos u - \cos v = -2 \sin\left(\frac{u+v}{2}\right) \sin\left(\frac{u-v}{2}\right)$

Find the exact value of $\sin 195° + \sin 105°$

Solve on the interval $[0, 2\pi)$: $\sin 4x - \sin 2x = 0$

Verify $\frac{\sin 6x + \sin 4x}{\cos 6x + \cos 4x} = \tan 5x$