Name: _____

Sum and Difference Formulas

1) Find the exact value of each expression

   1) $\sin 40^0 \cos 160^0 - \cos 40^0 \sin 160^0$

   2) $\cos 40^0 \cos 50^0 - \sin 40^0 \sin 50^0$

   3) $\cos 87^0 \cos 93^0 - \sin 87^0 \sin 93^0$

   4) $\cos \dfrac{7\pi}{9} \cos \dfrac{2\pi}{9} - \sin \dfrac{7\pi}{9} \sin \dfrac{2\pi}{9}$

   5) $\dfrac{\tan 80^0 - \tan\left(-55^0\right)}{1 + \tan 80^0 \tan\left(-55^0\right)}$

   6) $\dfrac{\tan 80^0 + \tan 55^0}{1 - \tan 80^0 \tan 55^0}$

2) Simplify each of the following expressions, showing every step of your argument:

   1) $\sin 3x \cos x + \sin x \cos 3x$ 2) $\cos 5x \cos x + \sin x \sin 5x$

3) Use identities to find each exact value.

1)	$\cos\left(-15^0\right)$	2)	$\cos\left(-105^0\right)$
3)	$\cos\left(105^0\right)$	4)	$\cos\left(75^0\right)$
5)	$\cos\left(-\dfrac{\pi}{12}\right)$	6)	$\tan \dfrac{5\pi}{12}$
7)	$\cos \dfrac{7\pi}{12}$	8)	$\cos \dfrac{5\pi}{12}$
9)	$\sin 75^0$	10)	$\cos 15^0$
11)	$\tan \dfrac{\pi}{12}$	12)	$\sin \dfrac{\pi}{12}$
13)	$\sin\left(-\dfrac{7\pi}{12}\right)$	14)	$\tan\left(-\dfrac{7\pi}{12}\right)$
15)	$\tan \dfrac{7\pi}{12}$	16)	$\cos\left(-\dfrac{7\pi}{12}\right)$