Math 3 Name_____

Unit 4.5 Double Angle Identities PRACTICE

Period____

Verify each identity.

1) $\dfrac{2}{\csc^2 x} = 1 - \cos 2x$

$\dfrac{2}{\csc^2 x}$ Use $\csc x = \dfrac{1}{\sin x}$

$2\sin^2 x$ Use $\cos 2x = 1 - 2\sin^2 x$

$1 - \cos 2x$ ■

2) $\dfrac{\sin 4x}{\sin 2x} = 2\cos 2x$

$\dfrac{\sin 4x}{\sin 2x}$ Use $\sin 4x = 2\sin 2x\cos 2x$

$\dfrac{2\sin 2x\cos 2x}{\sin 2x}$ Cancel common factors

$2\cos 2x$ ■

3) $\sec^2 x - 2\cos^2 x = -\cos 2x + \tan^2 x$

$\sec^2 x - 2\cos^2 x$ Use $\tan^2 x + 1 = \sec^2 x$

$\tan^2 x + 1 - 2\cos^2 x$ Use $\cos 2x = 2\cos^2 x - 1$

$-\cos 2x + \tan^2 x$ ■

4) $\cos 2x\tan 2x = 2\sin x\cos x$

$\cos 2x\tan 2x$ Use $\tan 2x = \frac{\sin 2x}{\cos 2x}$

$\frac{\cos 2x\sin 2x}{\cos 2x}$ Cancel common factors

$\sin 2x$ Use $\sin 2x = 2\sin x\cos x$

$2\sin x\cos x$ ■

5) $\frac{\sin 2x}{2\cos^2 x} = \frac{1}{\cot x}$

$\frac{\sin 2x}{2\cos^2 x}$ Use $\sin 2x = 2\sin x\cos x$

$\frac{2\sin x\cos x}{2\cos^2 x}$ Cancel common factors

$\frac{\sin x}{\cos x}$ Use $\cot x = \frac{\cos x}{\sin x}$

$\frac{1}{\cot x}$ ■

6) $\frac{\sin 2x}{1 + \cos 2x} = \frac{1}{\cot x}$

$\frac{\sin 2x}{1 + \cos 2x}$ Use $\sin 2x = 2\sin x\cos x$

$\frac{2\sin x\cos x}{1 + \cos 2x}$ Use $\cos 2x = 2\cos^2 x - 1$

$\frac{2\sin x\cos x}{2\cos^2 x}$ Cancel common factors

$\frac{\sin x}{\cos x}$ Use $\cot x = \frac{\cos x}{\sin x}$

$\frac{1}{\cot x}$ ■

7) $\frac{\cot x}{1 + \cos 2x} = \frac{1}{\sin 2x}$

$\frac{\cot x}{1 + \cos 2x}$ Use $\cos 2x = 2\cos^2 x - 1$

$\frac{\cot x}{2\cos^2 x}$ Use $\cot x = \frac{\cos x}{\sin x}$

$\frac{\cos x}{2\sin x\cos^2 x}$ Cancel common factors

$\frac{1}{2\sin x\cos x}$ Use $\sin 2x = 2\sin x\cos x$

$\frac{1}{\sin 2x}$ ■