Name: _____Kevin Braza – KEY _____ Date: _____ IB Math A&A SL

Lesson 7.6 – Even More Trig Proof Problems!

1. $\frac{\sin(4t)-\sin(2t)}{\cos(4t)+\cos(2t)} = \tan t$

$\frac{2\sin(2t)\cos(2t)-\sin(2t)}{(2\cos^2(2t)-1)+\cos(2t)}$

$\frac{\sin(2t)[2\cos(2t)-1]}{2\cos^2(2t)+\cos(2t)-1}$

$\frac{\sin(2t)[2\cos(2t)-1]}{2\cos^2(2t)+2\cos(2t)-\cos(2t)-1}$

$\frac{\sin(2t)[2\cos(2t)-1]}{2\cos(2t)[\cos(2t)+1]-1[\cos(2t)+1]}$

$\frac{\sin(2t)[2\cos(2t)-1]}{(2\cos(2t)-1)[\cos(2t)+1]}$

$\frac{\sin(2t)}{\cos(2t)+1}$

$\frac{2\sin(t)\cos(t)}{2\cos^2(t)-1+1}$

$\frac{2\sin(t)\cos(t)}{2\cos^2(t)}$

$\tan(t)$

2. $\frac{\sin(2x)}{\sin x+\cos x-1} = \sin x + \cos x + 1$

$\frac{\sin(2x)}{\sin x+\cos x-1}\cdot\frac{\sin x+\cos x+1}{\sin x+\cos x+1}$

$\frac{\sin(2x)\,(\sin x+\cos x+1)}{\sin x\,(\sin x+\cos x+1)+\cos x\,(\sin x+\cos x+1)-1(\sin x+\cos x+1)}$

$\frac{\sin(2x)\,(\sin x+\cos x+1)}{(\sin^2 x+\sin x\cos x+\sin x)+(\sin x\cos x+\cos^2 x+\cos x)+(-\sin x-\cos x-1)}$

$\frac{\sin(2x)\,(\sin x+\cos x+1)}{(\sin^2 x+\cos^2 x+-1)+(\sin x\cos x+\sin x\cos x)+(\sin x+-\sin x+\cos x-\cos x)}$

$\frac{\sin(2x)\,(\sin x+\cos x+1)}{2\sin x\cos x}$

$\sin x+\cos x+1$

3. $\frac{\sin\theta+\sin(3\theta)}{\cos\theta+\cos(3\theta)} = \tan(2\theta)$

$$\frac{(\sin 2\theta\cos\theta + \cos 2\theta\sin\theta) + \sin\theta}{(\cos 2\theta\cos\theta - \sin 2\theta\sin\theta) + \cos\theta}$$

$$\frac{(\sin 2\theta\cos\theta + \cos 2\theta\sin\theta) + \sin\theta}{(\cos 2\theta\cos\theta - 2\sin\theta\cos\theta\sin\theta) + \cos\theta}$$

$$\frac{(\sin 2\theta\cos\theta + \cos 2\theta\sin\theta) + \sin\theta}{\cos\theta\,(\cos 2\theta - 2\sin^2\theta + 1)}$$

$$\frac{(\sin 2\theta\cos\theta + \cos 2\theta\sin\theta) + \sin\theta}{\cos\theta\left(\cos 2\theta - 2(\frac{1}{2}(1-\cos 2\theta) + 1\right)}$$

$$\frac{(\sin 2\theta\cos\theta + \cos 2\theta\sin\theta) + \sin\theta}{\cos\theta\,(\cos 2\theta - 1 + \cos 2\theta + 1)}$$

$$\frac{(\sin 2\theta\cos\theta + \cos 2\theta\sin\theta) + \sin\theta}{\cos\theta\,(2\cos 2\theta)}$$

$$\frac{(\sin 2\theta\cos\theta + (2\cos^2\theta - 1)\sin\theta + \sin\theta}{\cos\theta\,(2\cos 2\theta)}$$

$$\frac{\sin 2\theta\cos\theta + 2\cos^2\theta\sin\theta - \sin\theta + \sin\theta}{\cos\theta\,(2\cos 2\theta)}$$

$$\frac{\sin 2\theta\cos\theta + 2\cos^2\theta\sin\theta}{\cos\theta\,(2\cos 2\theta)}$$

$$\frac{\sin 2\theta\cos\theta + 2\cos^2\theta\sin\theta}{\cos\theta\,(2\cos 2\theta)}$$

$$\frac{\sin 2\theta + 2\cos\theta\sin\theta}{2\cos 2\theta}$$

$$\frac{\sin 2\theta + \sin 2\theta}{2\cos 2\theta}$$

$$\frac{2\sin 2\theta}{2\cos 2\theta}$$

$$\tan 2\theta$$