Name: _____ Date: _____ IB Math A&A SL

Lesson 7.4 – Double Angle Formula – Other Applications and Proofs

I. Warm-Up

1. Verify the following identity: $\cot x - \tan y = \frac{\cos(x+y)}{\sin x \cos y}$

2. Let $\tan x = -\frac{3}{4}$ and x exists in Quadrant IV. Find $\sin x$ and $\cos x$.

II. Using Triangles in Double Angle Formula

3. Use the results from #2. Use the double angle formulas to find:
   a. $\sin(2x)$ b. $\cos(2x)$ c. $\tan^2(2x)$

4. Let $\sin\theta = \frac{5}{13}$ and $\frac{\pi}{2} < \theta < \pi$
   a. Find $\sin(2\theta)$ b. Find $\cos(2\theta)$ c. Find $\tan(2\theta)$

III. Trig Proofs with Double Angle Formulas

Verify the following identities.

5. $\sin(2x) = \tan(x)(1 + \cos(2x))$

6. $\sin(3x) = 3\sin x - 4\sin^3 x$

7. $\cos^2 x = \frac{1}{2}(\cos(2x) + 1)$

8. $\sec(2\theta) = \frac{\sec^2(\theta)}{2 - \sec^2(\theta)}$

9. $\cos(4x) = 8\cos^4 x - 8\cos^2 x + 1$