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

Lesson 5.3 – Double Angle Formula – Trig. Equations

**I.** **Deriving the Double Angle Formulas**
1. Find $\sin(2\theta)$ using $\sin(\theta + \theta)$

2. Find $\cos(2\theta)$ using $\cos(\theta + \theta)$

**II.** **Using Double Angle Formulas to Solve Trig. Equations**
Solve for $\theta$ in the interval $[0, 2\pi)$

3. $2\sin^2\theta + \sin(2\theta) = 0$

$$\boxed{\begin{array}{c} \textbf{Double Angle Formulas} \\[4pt] \sin 2u = 2\sin u \cos u \\[4pt] \cos 2u = \cos^2 u - \sin^2 u \\[4pt] \cos 2u = 1 - 2\sin^2 u \\[4pt] \cos 2u = 2\cos^2 u - 1 \\[4pt] \tan 2u = \dfrac{2\tan u}{1 - \tan^2 u} \end{array}}$$

Which formula of cosine should you use and why?
4. $\cos(2\theta) + \cos\theta = 0$

5. $4\sin^2\theta - \sin\theta = \cos(2\theta)$ *[Use Calculator]*

**III.** **Practice** – Solve for $x$ or $\theta$ in the interval $[0, 2\pi)$.

6. $\cos^2 \theta = \frac{1}{2} \sin(2\theta)$

7. $\cos(2\theta) + \sin^2 \theta = 0$

8. $10 \cos^2 x - 5 \cos x - 1 = -\cos(2x)$      [*Use Calculator*]

9. $4 \sin x \cos x - \sqrt{3} = 0$