Precalculus Test Chapter 5 Name _____

I. Matching

Match each of the expressions in the left hand column with an equivalent expression from the right column.

_____ 1. $\sin(A + B)$

_____ 2. $\cos(A - B)$

_____ 3. $\cos\left(\frac{\pi}{2} - A\right)$

_____ 4. $\cos^2 A$

_____ 5. $\sec A$

_____ 6. $\tan A$

_____ 7. $\cos(2A)$

_____ 8. $\sec^2 A - 1$

A. $\cos^2 A - \sin^2 A$

B. $\sin A$

C. $\frac{\sin A}{\cos A}$

D. $\frac{1}{\cos A}$

E. $\tan^2 A$

F. $2\sin A\cos A$

G. $\sin(2A)$

H. $1 - \sin^2 A$

I. $\cot A$

J. $\sin A\cos B + \cos A\sin B$

K. $\cos A\cos B + \sin A\sin B$

L. $\sin A\cos B - \sin B\cos A$

M. $\cos A\cos B - \sin A\sin B$

N. No match

II. Trig Equations

Solve each of the following equations below, showing all work on ***your own*** paper.

9. Solve the equation: $3 \tan x + 3 = 0$

10. Solve the equation: $2 \cos^2 x - 1 = 0$

11. Determine all the solutions to the equation in the interval $[0, 2\pi)$: $\cos 3\theta = 0$

12. Determine all the solutions to the equation in the interval $[0, 2\pi)$: $2\sin\theta + \sqrt{3} = 0$

13. Determine all the solutions to the equation in the interval $[0, 2\pi)$:

$$2\cos^2\theta + \cos\theta = 1$$

14. Choose **one** of the following:

A. Determine all the solutions to the equation in the interval $[0, 2\pi)$:

$$\sin 2\theta - \cos\theta = 0$$

B. Determine all the solutions to the equation in the interval $[0, 2\pi)$:

$$\sin 6\theta \cos 3\theta - \cos 6\theta \sin 3\theta = \frac{1}{2}$$

III. Prove the following identities on your own paper:

15. $\sin^2 x \cos^2 x + \cos^4 x = \cos^2 x$

16. $1 - 2\sin^2 x + \sin^4 x = \cos^4 x$

17. $\dfrac{\sin 2\theta}{1 + \cos 2\theta} = \dfrac{\sin\theta}{\cos\theta}$

18. $\cos(x + y) + \cos(x - y) = 2\cos x \cos y$

19. $\dfrac{\sec^2 x - 6\tan x + 7}{\sec^2 x - 5} = \dfrac{\tan x - 4}{\tan x + 2}$

20. $\dfrac{\csc x}{\cos x} - \dfrac{\cos x}{\sin x} = \tan x$

BONUS: Prove the identity: $\cos^2\left(\frac{\theta}{2}\right) - \frac{\cos\theta}{2} = \frac{1}{2}$