Name_____ Date_____ Period_____

PreAP Precalculus TEST: 6.1-6.4: NO Calculator. Show ALL steps

Part I: Trig Proofs—Prove 4 out of 5 Identities. Show all steps including substitutions and algebraic procedures.

1. $\csc x - \cos x \cot x = \sin x$

2. $\dfrac{\cos(-x)}{\sec(-x)+\tan(-x)} = 1-\sin(-x)$

3. $\dfrac{1+\tan x}{1-\tan x} + \dfrac{1+\cot x}{1-\cot x} = 0$

4. $\sin^2 x \cos^3 x = \left(\sin^2 x - \sin^4 x\right)(\cos x)$

5. $\dfrac{\sin x}{1+\sec x} = \dfrac{\sin x \sin\left(\dfrac{\pi}{2}-x\right)}{\cos x + 1}$

Part II: Solving Trigonometric Equations— For each of the following, solve each trig function without a calculator, where $0 \le x < 2\pi$. Show all work and give exact answers.

6. $\cos 2x + 5\cos x = 2$

7. $-6\sin 3x = 3\sqrt{3}$

8. $4\tan^2 x = 3\tan^2 x + 3$

Part III: Trig Proofs

Prove 3 out of 4 Identities. Show all steps including substitutions and algebraic procedures.

9. $\cos^2\left(\frac{-x}{2}\right) = \frac{1+\sec x}{2\sec x}$

10. $\sin^5 x = \left(\frac{1}{8}\sin x\right)(3 - 4\cos 2x + \cos 4x)$

11. $\tan\left(x + \frac{\pi}{4}\right) = \frac{1+\tan x}{1-\tan x}$

12. $\frac{\sin(x+y)}{\sin(x-y)} = \frac{\tan x + \tan y}{\tan x - \tan y}$