Precalculus Test Sections 5.1 – 5.2 Name _____

1 – 5. Multiple Choice. Show work.

_____ 1. Perform the addition and simplify: $\frac{\tan x}{\csc x}+\frac{\sin x}{\tan x}$

A. cos(x) B. $\csc^2 x$ C. $\sec^2 x$ D. sec(x)
E. None of these

_____ 2. Given csc(x) = -3 and tan x >0, determine cos(x)

A. $\frac{2\sqrt{2}}{3}$ B. $\frac{-3\sqrt{2}}{2}$ C. $\frac{-2\sqrt{2}}{3}$ D. $\frac{3\sqrt{2}}{2}$ E. None of these

_____ 3. Simplify $\frac{\cos^4 x-\sin^4 x}{\cos^2 x-\sin^2 x}$

A. $1-2\sin^2 x$ B. $\cos^2 x-\sin^2 x$ C. 1 D. –1
E. None of these

_____ 4. Simplify: $\frac{\csc(x)}{\tan(x)+\cot(x)}$

A. cos(x) + tan(x) B. $\sin^2 x+\cos x$ C. $\csc^2 x\sec x$
D. cos(x) E. None of these

_____ 5. Factor and simplify: $\cot^4 x+2\cot^2 x+1$

A. $\tan^4 x$ B. $\sec^4 x$ C. $\csc^4 x$ D. $\csc^2 x$
E. None of these

6 – 11. Free Response. Show ***all work*** on your own paper.
Prove each of the following identities:

6. $\cos^2 x \csc^2 x = \csc^2 x - 1$

7. $\cot x + \tan x = \csc(x) \sec(x)$

8. $\sin(x) \tan(x) + \cos(x) = \sec(x)$

9. Choose ***one*** of the following identities to prove:

   A. $(\sec x + 1)(\sec x - 1) = \tan^2 x$

   B. $\dfrac{\cos^2 x}{1 + \sin x} = 1 - \sin x$

10. Choose ***one*** of the following identities to prove:

   A. $\dfrac{\sin^3 A + \cos^3 A}{\sin A + \cos A} = 1 - \sin A \cos A$

   B. $\dfrac{1}{\cot^2 y} - \dfrac{1}{\cos^2 y} = -1$

11. Choose ***one*** of the following identities to prove:

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

   B. $\dfrac{1 - 3\cos x - 4\cos^2 x}{\sin^2 x} = \dfrac{1 - 4\cos x}{1 - \cos x}$

12. *Extra Credit*

   Prove : $\dfrac{1 + \sin x + \cos x}{1 - \sin x + \cos x} = \dfrac{1 + \sin x}{\cos x}$