Getting to Know
the Basic Trig Identities

Name _____

List all identities equivalent to the given trig function.

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

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

3. $\tan x = \dfrac{\sin x}{\cos x}$ $\tan x = \dfrac{1}{\cot x}$ $\tan x = \cot\left(\dfrac{\pi}{2} - x\right)$

4. $\csc x = \dfrac{1}{\sin x}$ $\csc x = \sec\left(\dfrac{\pi}{2} - x\right)$

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

6. $\cot x = \dfrac{\cos x}{\sin x}$ $\cot x = \dfrac{1}{\tan x}$ $\cot x = \tan\left(\dfrac{\pi}{2} - x\right)$

Fill in the blanks and/or complete each trig identity.

7. $\sin^2 x + \underline{\cos^2 x} = 1$

8. $\sin\left(\dfrac{\pi}{2} - x\right) = \cos x$

9. $\dfrac{\sin x}{\cos x} = \tan x$

10. $\sin(-x) = -\sin x$

11. $\sec^2 x = 1 + \tan^2 x$

12. $\dfrac{1}{\cos x} = \sec x$

Other identities can be formed by rearranging the basic trig identities.
Fill in the blanks to create other identities *that you did not already list on the front side!*

13. $\sin^2 x = \underline{1 - \cos^2 x}$

14. $\sin x = - \underline{\sin(-x)}$

15. $\sin x = (\underline{\cos x}) \cdot (\underline{\tan x})$

16. $\tan^2 x = \underline{\sec^2 x - 1}$

17. $\sin x = \dfrac{(\underline{\cos x})}{(\underline{\cot x})}$

17. $1 + \cot^2 x = \underline{\csc^2 x}$

By manipulating the basic trig identities, you can create nine expressions that are equivalent to 1!
Write these 9 identities that are all equivalent to 1.

$\underline{\sin x \cdot \csc x = 1}$ $\longleftarrow \longrightarrow$ $\underline{\csc x \cdot \sin x = 1}$

$\underline{\cos x \cdot \sec x = 1}$ $\longleftarrow \longrightarrow$ $\underline{\sec x \cdot \cos x = 1}$

$\underline{\tan x \cdot \cot x = 1}$ $\longleftarrow \longrightarrow$ $\underline{\cot x \cdot \tan x = 1}$

$\underline{\sin^2 x + \cos^2 x = 1}$ $\underline{\sec^2 x - \tan^2 x = 1}$

$\underline{\csc^2 x - \cot^2 x = 1}$