Name _____ Date _____

Practice 8.2b: Verifying Trig Identities

Verify the following Trig IDs. Show your work

1. $\frac{1}{\sin x}+\frac{1}{\csc x}=\csc x+\sin x$

2. $\frac{\cos(90°-\alpha)}{\sin(90°-\alpha)}=\tan\alpha$

3. $\cos(90°-\theta)\csc\theta = 1$

4. $\frac{\csc(-\sigma)}{\sec(-\sigma)}=-\cot\sigma$

5. $\frac{1}{\csc^2 x}+\frac{1}{\sec^2 x}=1$

$\sin^2x+\cos^2x=1$

6. $\frac{\sec x-1}{1-\cos x}=\sec x$

$\frac{\frac{1}{\cos x}-1}{1-\cos x}\cdot\frac{\cos x}{\cos x}=\frac{(1-\cos x)}{(1-\cos x)\cos x}=\frac{1}{\cos x}=\sec x$

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

8. $\frac{(\sec x+\tan x)}{\sec x-\tan x}=(\sec x+\tan x)^2$

$\frac{(\sec x+\tan x)}{(\sec x-\tan x)}\cdot\frac{(\sec x+\tan x)}{(\sec x+\tan x)}=\frac{(\sec x+\tan x)^2}{\sec^2x-\tan^2x}$

9. $\frac{\cos\theta\cot\theta}{1-\sin\theta}-1=\csc\theta$

$\frac{1+\sin\theta}{1+\sin\theta}\cdot\frac{\cos\theta\frac{\cos}{\sin\theta}}{1-\sin\theta}-1=\frac{1+\sin\theta\left(\cos\theta\frac{\cos\theta}{\sin\theta}\right)}{1-\sin^2\theta}-1$

$\frac{\cos\theta\cdot\frac{\cos\theta}{\sin\theta}+\sin\theta\cos\theta\frac{\cos\theta}{\sin\theta}}{\cos^2\theta}-1$

$\csc\theta-\frac{1}{\sin\theta}+1-1\quad\frac{\frac{\cos^2\theta}{\sin\theta}+\cos^2\theta}{\cos^2\theta}-1=\frac{\cos^2\theta\left(\frac{1}{\sin\theta}+1\right)}{\cos^2\theta}$

10. $\cos x - \dfrac{\cos x}{1-\tan x} = \dfrac{\sin x \bullet \cos x}{\sin x - \cos x}$

11. $2\sec^2 x - 2\sec^2 x \sin^2 x - \sin^2 x - \cos^2 x = 1$

12. $\csc x(\csc x - \sin x) + \dfrac{\sin x - \cos x}{\sin x} + \cot x = \csc^2 x$

13. $2 + \cos^2 x - 3\cos^4 x = \sin^2 x(2 + 3\cos^2 x)$

14. $\sec^4 \theta - \tan^4 \theta = 1 + 2\tan^2 \theta$

15. $\dfrac{\sin x}{1-\cos x} = \dfrac{1+\cos x}{\sin x}$

16. $\sqrt{\dfrac{1+\sin x}{1-\sin x}} = \dfrac{1+\sin x}{|\cos x|}$

Extra Credit. $\dfrac{\sin x \bullet \cos y + \cos x \bullet \sin y}{\cos x \bullet \cos y - \sin x \bullet \sin y} = \dfrac{\tan x + \tan y}{1 - \tan x \bullet \tan y}$