Precalculus Name: _____

Simplifying Trigonometric Expressions

Simplify each of the following.

1. $\sec x \cos x$

2. $\dfrac{\sin(-x)}{\cos(-x)}$

3. $\tan^2 x - \sec^2 x$

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

5. $\cot x \sin x$

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

7. $\sin x \sec x$

8. $\cos^2 x\left(\sec^2 x - 1\right)$

9. $\dfrac{\sec^2 x - 1}{\sin^2 x}$

10. $\cot x \sec x$

11. $\sec^4 x - \tan^4 x$

12. $\dfrac{\cos^2\left(\frac{\pi}{2}-x\right)}{\cos x}$

13. $\tan\theta \csc\theta$

14. $\sin\theta\left(\csc\theta - \sin\theta\right)$

15. $\cos\beta \tan\beta$

16. $\sec\alpha \dfrac{\sin\alpha}{\tan\alpha}$

17. $\dfrac{\cot x}{\csc x}$

18. $\dfrac{\csc\theta}{\sec\theta}$

19. $\sec^2 x\left(1-\sin^2 x\right)$

20. $\dfrac{1}{\tan^2 x + 1}$

21. $\dfrac{\sin(-x)}{\cos x}$

22. $\dfrac{\tan^2 x}{\sec^2 x}$

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

24. $\cot\left(\dfrac{\pi}{2}-x\right)\cos x$

25. $\dfrac{\cos^2 y}{1-\sin y}$

26. $\cos t\left(1+\tan^2 t\right)$

27. $\tan^2 x-\tan^2 x\sin^2 x$

28. $\sec^2 x\tan^2 x+\sec^2 x$

29. $\sec^2 x\sin^2 x-\sin^2 x$

30. $\dfrac{\sec^2 x-1}{\sec x-1}$

31. $\tan^4 x+2\tan^2 x+1$

32. $1-2\cos^2 x+\cos^4 x$

33. $\sin^4 x-\cos^4 x$

34. $\csc^3 x-\csc^2 x-\csc x+1$

Perform the indicated operation and simplify.

35. $(\sin x+\cos x)^2$

36. $(\cot x+\csc x)(\cot x-\csc x)$

37. $(\sec x-1)(\sec x+1)$

38. $(3-3\sin x)(3+3\sin x)$

39. $\dfrac{1}{1+\cos x}+\dfrac{1}{1-\cos x}$

40. $\dfrac{1}{\sec x+1}-\dfrac{1}{\sec x-1}$

41. $\dfrac{\cos x}{1+\sin x}+\dfrac{1+\sin x}{\cos x}$

42. $\tan x-\dfrac{\sec^2 x}{\tan x}$