

TRIGONOMETRIC IDENTITIES

$$1. \quad \frac{\cos \theta}{1 - \sin \theta} = \sec \theta + \tan \theta$$

$$2. \quad \frac{\cos 2\theta + 1}{\sin 2\theta} = \frac{\cos \theta}{\sin \theta}$$

$$3. \quad \frac{\sec \theta - \cos \theta}{\tan \theta} = \sin \theta$$

$$4. \quad \frac{\cos \theta + \sin \theta \tan \theta}{\sin \theta \sec \theta} = \csc \theta$$

$$5. \quad \frac{1}{1 + \sin \theta} = \sec^2 \theta - \frac{\tan \theta}{\cos \theta}$$

$$6. \quad \tan^2 \theta - \sin^2 \theta = \tan^2 \theta \sin^2 \theta$$

$$7. \quad \sin \theta + \cos \theta \cot \theta = \csc \theta$$

$$8. \quad \frac{\sin 2\theta}{2 - 2 \cos^2 \theta} = \cot \theta$$

$$9. \quad \frac{1 - \cos \theta}{\sin^2 \theta} = \frac{1}{1 + \cos \theta}$$

$$10. \quad \frac{\csc \theta}{\tan \theta + \cot \theta} = \cos \theta$$

$$11. \quad \frac{\cot \theta}{\csc \theta - 1} = \frac{\csc \theta + 1}{\cot \theta}$$

$$12. \quad \frac{\sin \theta + \tan \theta}{1 + \cos \theta} = \frac{\sin 2\theta}{2 \cos^2 \theta}$$

$$13. \quad \frac{\sin 2\theta}{\cos \theta} + \frac{\cos 2\theta}{\sin \theta} = \csc \theta$$

$$14. \quad \csc^2 x + \sec^2 x = \csc^2 x \sec^2 x$$

$$15. \quad \frac{1}{\sec \theta + \tan \theta} = \frac{1 - \sin \theta}{\cos \theta}$$

$$16. \quad \frac{\cos 2\theta}{\sin \theta} = \frac{\cot^2 \theta - 1}{\csc \theta}$$

$$17. \quad (1 - \sin \theta)(\sec \theta + \tan \theta) = \frac{1}{\sec \theta}$$

$$18. \quad \frac{\sin \theta \cos \theta}{1 + \cos \theta} = \frac{1 - \cos \theta}{\tan \theta}$$

$$19. \frac{\sin 2x}{1 - \cos 2x} = \cot x$$

$$20. \sin 2x(\tan x + \cot x) = 2$$

$$21. \frac{2 \cos x + 2 \cos^2 x}{\sin 2x} = \frac{\sin x}{1 - \cos x}$$

$$22. (\csc \theta - \sin \theta) \tan \theta = \frac{\sin 2\theta}{2 \sin \theta}$$

$$23. \frac{\cot \theta}{\sin \theta - \csc \theta} = -\sec \theta$$

$$24. \frac{\sin x}{1 - \sin x} - \frac{\sin x}{1 + \sin x} = 2 \tan^2 x$$

$$25. \frac{\cos \theta + \cot \theta}{1 + \sin \theta} = \cot \theta$$

$$26. \frac{\cos x + \cot x}{\sec x + \tan x} = \cos x \cot x$$

$$27. \tan \theta \cos 2\theta + \tan \theta = \sin 2\theta$$

$$28. \csc \theta \sin 2\theta - \sec \theta \cos 2\theta = \sec \theta$$

$$29. \frac{1 - \cos 2x}{\sin 2x} = \frac{1 + \tan x}{1 + \cot x}$$

$$30. \cos 2x = \frac{\cot x - \sin 2x}{\cot x}$$

$$31. \frac{\tan x(\cos x + \cot x)}{\sec x + \tan x} = \frac{\sin x \sin 2x}{2 - 2 \cos^2 x}$$

$$32. \frac{\tan x + \sin x}{1 + \cos x} = \frac{1}{\csc 2x} - \frac{\tan x}{\sec 2x}$$

$$33. \frac{\tan x}{\sec + 1} = \frac{2 \cos x - 2 \cos^2 x}{\sin 2x}$$

$$34. \frac{\sin x}{1 - \sin x} + \frac{\sin x}{1 + \sin x} = \sin 2x \sec^3 x$$