

PROVE IT!!!!

1. $\sin(a + b) + \sin(a - b) = 2\sin a \cos b$

2. $\sin x \tan x = \sec x - \cos x$

3. $\sin(p + q)\sin(p - q) = \sin^2 p - \sin^2 q$

4. $\cos^4 x - \sin^4 x = 1 - 2\sin^2 x$

5. $\frac{\cos(x - y)}{\cos x \sin y} = \tan x + \cot y$

6. $\csc^2 x + \sec^2 x = \csc^2 x \sec^2 x$

7. $2\cos x \cos y = \cos(x + y) + \cos(x - y)$

8. $\cos^2 x \cos^2 y + \sin^2 x \sin^2 y +$

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

9. $2\cos x \cos y = \cos(x + y) + \cos(x - y)$

10. $\sec^2 x - \sec^2 y = \tan^2 x - \tan^2 y$

11. $\sin 4x = 4\cos x \sin x (2\cos^2 x - 1)$

12. $\frac{\tan x + \tan y}{\cot x + \cot y} = \tan x \tan y$

13. $\cot\left(\frac{5\pi}{4} + x\right) = -\frac{\tan x - 1}{\tan x + 1}$

14. $(\sec x - \cos x)(\csc x - \sin x) = \frac{\tan x}{1 + \tan^2 x}$

15. $\frac{\cos(x - y) - \cos(x + y)}{\cos(x - y) + \cos(x + y)} = \tan x \tan y$

16. $\cos^6 x + \sin^6 x = 1 - 3\sin^2 x + 3\sin^4 x$

17. $\cot a + \tan a = 2\csc 2a$

18. $\sec^6 x - \tan^6 x = 1 + 3\tan^2 x \sec^2 x$

19. $\frac{\sin^3 x - \cos^3 x}{\sin x - \cos x} = \frac{2 + \sin 2x}{2}$

20. $\frac{\sin x + \sin 2x + \sin 3x}{\cos x + \cos 2x + \cos 3x} = \tan 2x$

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