

Find the exact value of each expression.

1. $\frac{\tan 43^\circ - \tan 13^\circ}{1 + \tan 43^\circ \tan 13^\circ}$

2. $\cos \frac{5\pi}{12} \cos \frac{\pi}{4} + \sin \frac{5\pi}{12} \sin \frac{\pi}{4}$

3. $\sin 15^\circ \cos 75^\circ + \cos 15^\circ \sin 75^\circ$

4. $\sin \frac{\pi}{3} \cos \frac{\pi}{12} - \cos \frac{\pi}{3} \sin \frac{\pi}{12}$

5. $\cos 40^\circ \cos 20^\circ - \sin 40^\circ \sin 20^\circ$

6. $\frac{\tan 48^\circ + \tan 12^\circ}{1 - \tan 48^\circ \tan 12^\circ}$

Verify the following:

7. $\cos(\pi - \theta) = -\cos \theta$

8. $\cos(2\pi + \theta) = \cos \theta$

Verify the identities.

$$9. \sin(\pi - \theta) = \sin \theta$$

$$10. \sin(90^\circ + \theta) = \cos \theta$$

$$11. \sin(x + y) + \sin(x - y) = 2 \sin x \cos y$$

$$12. \cos x + \frac{\sin^2 x}{\cos x} = \sec x$$

$$13. \cos x + \tan x \sin x = \sec x$$

$$14. \sin^3 x(1 - 2\cos^2 x + \cos^4 x) = \sin^7 x$$

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