

Prove the given identity.

1. $\cos(x + 90^\circ) = -\sin x$

2. $\sin(x + \frac{\pi}{2}) = \cos x$

3. $\tan(x + \pi) = \tan x$

4. $\csc(x - 90^\circ) = -\sec x$

5. $\cos^2 x \csc x \sec x = \cot x$

6. $\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} = \frac{\csc x}{\cos x}$

Calculate $\sin 2A$, $\cos 2A$, and $\tan 2A$ for the angle described.

7. $\sin A = \frac{12}{13}$; A in Quadrant I

8. $\cos A = -\frac{12}{13}$; A in Quadrant II

9. $\tan A = \frac{12}{5}$; A in Quadrant III

10. $\tan A = -\frac{5}{12}$; A in Quadrant IV

Calculate $\sin \frac{1}{2}A$, $\cos \frac{1}{2}A$, $\tan \frac{1}{2}A$ for the angle described.

11. $\cos A = \frac{5}{13}$; A in Quadrant I

12. $\cos A = \frac{5}{13}$; A in Quadrant IV

13. $\cos A = -\frac{5}{13}$; A in Quadrant III

14. $\cos A = -\frac{5}{13}$; A in Quadrant II