

On your answer sheet, write the letter corresponding to the expression from the table that is equivalent to the trigonometric expression for each numbered question; i.e., complete the trigonometric identity with one of the expressions in the box. A lettered expression may be used more than once, and some lettered expressions will not be used at all. Each question will be answered with a single letter. Assume α and β are in standard position with terminal side in the first quadrant. Also assume α and β only take on values where all expressions are defined.

A) 1	J) $\sin \alpha$	S) $\cos \alpha + \cos \beta$
B) 2	K) $\sin(2\alpha)$	T) $\cos \alpha \cdot \sin \beta$
C) 4	L) $\sin(4\alpha)$	U) $\cos \alpha + \sin \beta$
D) $\cos \alpha$	M) $\tan \alpha$	V) $\tan \alpha + \tan \beta$
E) $\cos(2\alpha)$	N) $\tan(2\alpha)$	W) $\frac{\sin \alpha}{1 + \cos \alpha}$
F) $\cos(3\alpha)$	O) $\csc \alpha + \sec \alpha$	X) $\frac{\tan \alpha}{1 + \tan \alpha}$
G) $\cos(4\alpha)$	P) $\csc \alpha - \sin \alpha$	Y) $2\cos^2 \alpha + 4\cos^3 \alpha$
H) $\sec \alpha$	Q) $\cot \alpha + \tan \alpha$	Z) $(2 - \cos^2 \alpha)(2 + \tan \alpha)$
I) $\sec(2\alpha)$	R) $\cos \alpha \cdot \cos \beta$	

1. _____ = $\frac{\sqrt{\csc^2 \alpha - 1}}{\csc \alpha}$

2. _____ = $\frac{1 - \tan^2 \alpha}{1 + \tan^2 \alpha}$

3. _____ = $\sec^2 \alpha - \tan^2 \alpha$

4. _____ = $\tan \frac{\alpha}{2}$

5. _____ = $\cos \alpha \cdot \cot \alpha$

6. _____ = $(\cos \alpha + \sin \alpha)(\cot \alpha + \tan \alpha)$

$$7. \text{ _____ } = \frac{1}{2}\cos(\alpha - \beta) + \frac{1}{2}\cos(\alpha + \beta)$$

$$8. \text{ _____ } = 4\sin\alpha \cdot \cos\alpha - 8\sin^3\alpha \cdot \cos\alpha$$

$$9. \text{ _____ } = \sin^2\alpha + \cos^2\alpha$$

$$10. \text{ _____ } = \frac{1 - \cos\alpha}{\sin\alpha}$$

$$11. \text{ _____ } = \frac{\sin(3\alpha)}{2\sin\alpha} - \frac{1}{2}$$

$$12. \text{ _____ } = 4\cos^3\alpha - 3\cos\alpha$$

$$13. \text{ _____ } = (\csc\alpha - \cot\alpha)(\sec\alpha + 1)$$

$$14. \text{ _____ } = \csc^2\alpha \cdot \sec^2\alpha - \tan^2\alpha - \cot^2\alpha$$

$$15. \text{ _____ } = 1 + 3\cos\alpha + \cos(2\alpha) + \cos(3\alpha)$$

$$16. \text{ _____ } = \frac{\sin\alpha}{\sin\alpha + \cos\alpha}$$

$$17. \text{ _____ } = 2\sin^2\alpha - \sin^4\alpha + \cos^4\alpha$$

$$18. \text{ _____ } = 2\cos\left(\frac{\alpha + \beta}{2}\right) \cdot \cos\left(\frac{\alpha - \beta}{2}\right)$$

$$19. \text{ _____ } = 8\cos^4\alpha - 8\cos^2\alpha + 1$$

$$20. \text{ _____ } = 4\cos\alpha \cdot \cos\left(\frac{\pi}{3} - \alpha\right) \cdot \cos\left(\frac{\pi}{3} + \alpha\right)$$