

Express the following in terms of a single trig function.

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

Find the exact values for the following trig expressions

3. $\sin \frac{5\pi}{12}$ 4. $\tan \frac{3\pi}{8}$

Given that $\sin(\alpha) = -\frac{12}{13}$ where $\pi < \alpha < \frac{3\pi}{2}$ and $\tan(\beta) = -\frac{3}{4}$ where $\frac{\pi}{2} < \beta < \pi$ find the exact values for the following (be aware of the quadrants):

5. $\sin(2\alpha)$ 6. $\tan(\alpha - \beta)$

7. $\cos\left(\frac{\beta}{2}\right)$ 8. $\sec(2\beta)$

Use Product-to-Sum and Sum-to-Product Identities to perform the following:

9. Write $\sin 3x \cos 5x$ as a sum or difference.

10. Write $\frac{\sin 4x + \sin 6x}{\cos 4x - \cos 6x}$ as a single trig function.

Prove the following Identity. Use this space below

11. $\frac{1}{\sec x - 1} + \frac{1}{\sec x + 1} = 2 \cot x \csc x$

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