

Double / Half Angle Quiz 2 Review

10. $\frac{\sin 2x}{1 - \cos 2x} = \cot x$

$$\frac{2 \sin x \cos x}{1 - (1 - 2 \sin^2 x)} \rightarrow \frac{2 \cancel{\sin x} \cos x}{1 - 1 + 2 \sin^2 x} = \frac{\cos x}{\sin x} = \cot x \checkmark$$

11. $\frac{\cos 2x}{\sin x \cos x} = \cot x - \tan x$

$$\frac{\cos^2 x - \sin^2 x}{\sin x \cos x} \rightarrow \frac{\cos^2 x}{\sin x \cos x} - \frac{\sin^2 x}{\sin x \cos x} \rightarrow \frac{\cos}{\sin} - \frac{\sin}{\cos} \rightarrow \cot - \tan \checkmark$$

12. $\frac{\tan x}{\sec x + 1} = \tan \frac{x}{2}$

$$\frac{\frac{\sin}{\cos} \cdot \cos}{\frac{1}{\cos} + 1 \cdot \cos} \rightarrow \frac{\sin}{1 + \cos x} \rightarrow \tan \frac{x}{2} \checkmark$$

13. $\frac{\sec^2}{\sin^2} = \csc^2 + \sec^2$

$$\frac{1}{\cos^2 - \sin^2} \rightarrow \frac{\cos^2 + \sin^2}{\cos^2 \sin^2} \rightarrow \frac{\cos^2}{\cos^2 \sin^2} + \frac{\sin^2}{\cos^2 \sin^2} \rightarrow \csc^2 + \sec^2$$

$$4. (1 + \sec x)(1 - \cos x) = \tan^2 x \cos x$$

$$1 + \sec x - \cos x - \sec \cdot \cos$$

$$1 + \frac{1}{\cos} - \cos x - \frac{1}{\cos} \cdot \cos$$

$$\frac{1}{\cos} - \cos x \left[\frac{\cos}{\cos} \right]$$

$$\frac{1 - \cos^2}{\cos} \rightarrow \frac{\sin^2 x}{\cos} \cdot \frac{\cos}{\cos} \rightarrow \tan^2 x \cos$$

$$17. \cot^2 - \cos^2 = \cot^2 \cos^2$$

$$\frac{\cos^2}{\sin^2} - \frac{\cos^2}{1} \left[\frac{\sin^2}{\sin^2} \right] \rightarrow \frac{\cos^2 - \cos^2 \sin^2}{\sin^2} \rightarrow \frac{\cos^2 (1 - \sin^2)}{\sin^2}$$

$$\rightarrow \frac{\cos^2 \cdot \cos^2}{\sin^2} \rightarrow \cot^2 x \cos^2 x \checkmark$$

$$18. \sec^2 \csc^2 = \sec^2 + \csc^2$$

$\frac{1}{\cos^2 \sin^2}$... wait! This is exactly #13!
See #13 for the rest.