

Identities Practice #2 **CLEARLY SHOW ALL WORK ON A SEPARATE SHEET OF PAPER!**

Simplify each expression.

1. $\cos 2x + \sin^2 x + \cos^2 x$ 2. $\csc x - \cos x \cdot \cot x$ 3. $\sin x + \sin x \cdot \cot^2 x$ 4. $\frac{\sin x}{1 + \cos x} + \frac{\sin x}{1 - \cos x}$
5. $\cos^2 x \cdot \tan^2 x + \cos^2 x$ 6. $(\sec x - \tan x)(1 + \sin x)$ 7. $\frac{\sin 2x}{\cos x} + \sin x$ 8. $\sin(-x) + \sin x + \cos(-x) + \cos x$

Check #1-8: <i>sinx</i> <i>cosx</i> <i>cscx</i> <i>2cos²x</i> <i>2cscx</i> <i>2cosx</i> <i>3sinx</i> <i>1</i>

Verify that each equation is an identity (yes, all of them are identities.) **CLEARLY SHOW ALL STEPS!**

→ Start with the “more complicated” side and rewrite/simplify until it matches the other side that stays “as is.”

9. $\frac{1 + \tan^2 x}{\csc x \sec x} = \tan x$ 10. $\sec x + \csc x = \frac{\sin x + \cos x}{\sin x \cos x}$
11. $\sin x \cdot \tan x = \sec x - \cos x$ 12. $(\sin x - 1)(\tan x + \sec x) = -\cos x$

- Hints:*
1. *rewrite using double angle identity, combine like terms*
 2. *rewrite in terms of sin/cos, combine fractions, substitute, then cancel.*
 3. *factor out sin x, then use substitution, rewrite, then cancel.*
 4. *get common denominator, use FOIL method in denominators and distribute in numerators, combine fractions, then make a substitution and cancel.*
 5. *factor common term, make a substitution, rewrite, and cancel*
 6. *rewrite in terms of sin/cos, combine fractions (subtract 1st, then multiply), substitute, cancel*
 7. *rewrite using double angle identity, cancel, add like terms*
 8. *rewrite using opposite angle identities, combine like terms*
 9. *substitute Pythagorean identity, cancel, rewrite in terms of sin/cos, invert and solve*
 10. *split apart fraction, cancel, rewrite*
 11. *rewrite secx, get common denominator, substitute, split apart numerator, simplify*
 12. *use FOIL method, rewrite in terms of sin/cos, combine fractions, factor -1 from numerator, substitute, cancel*