

**Identities Practice Sheet #1****Name:**Rewrite each expression by factoring.

1.  $\cos x - \cos x \cdot \tan^2 x = \underline{\cos x} ( \quad - \quad )$

2.  $\csc^2 x \cdot \cot^2 x + \csc^2 x$

3.  $\sec^2 x - 1 = ( \quad + \quad ) ( \quad - \quad )$

4.  $\sin^2 x - \cos^2 x$

5.  $2\cos^2 x - \cos x$

6.  $1 - \sin^2 x$

7.  $\sec^2 x - \tan^2 x$

8.  $\sin x + \sin x \cos x$

**Check answers for #9-13** (answers are in random order)***sinx + cosx******1******csc<sup>2</sup>x******secx******secx - 1***Simplify each expression. Clearly show all steps.

9.  $\cos x + \cos x \cdot \tan^2 x$

10.  $\sin^2 x \cdot \cot^2 x + \sin^2 x$

11.  $\frac{\sec^2 x - 1}{\sec x + 1}$

12.  $\frac{\sin^2 x - \cos^2 x}{\sin x - \cos x}$

13.  $\frac{\sin^2 x + \cos^2 x}{\sin^2 x}$

Verify that each equation is an identity.

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

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

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- Hints:
9. factor common term, substitute Pythagorean identity, rewrite using reciprocal identity
  10. factor common term, substitute Pythagorean identity, rewrite using reciprocal identity
  11. factor difference of squares, then cancel like terms
  12. factor difference of squares, then cancel like terms
  13. substitute Pythagorean identity, then rewrite using reciprocal identity
  14. substitute Pythagorean identities, rewrite using reciprocal identity, use quotient identity
  15. factor the numerator and the denominator, cancel like terms, split fraction apart using common denominator, use reciprocal and quotient identity