

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Learning Goal 6.1**

Using identities to reduce complexity in expressions and solve equations.

Things to remember before you get started:

1. Write as a single fraction.

a.  $\frac{2}{5} + \frac{3}{7}$

b.  $\frac{7}{x} + \frac{2x}{x+1}$

c.  $\sec x + \frac{\cos x}{\sin x}$

2. Simplify.

a.  $\frac{1 + \frac{1}{x}}{\frac{y}{x}}$

b.  $\sin x + \tan x$

c.  $\frac{\cos x + \tan x}{\cot x + \sec x}$

3. Factor.

a.  $2a + 14ab$

b.  $\sin x \cos x + \cos x$

c.  $\tan^2 x - 16$

d.  $\tan^2 x + 5 \tan x - 6$

4. State the non-permissible values (restrictions).

a.  $\frac{3x}{x} - \frac{7}{2x^2 - 4x + 2}$

b.  $\csc x$

c.  $\frac{\sin x \tan x}{\cos x - 1}$

**Example** Prove. State any non-permissible values.

a.  $\tan x = \frac{1 - \cos 2x}{\sin 2x}$

b.  $\frac{1}{1 + \sin x} = \frac{\sec x - \sin x \sec x}{\cos x}$

c.  $\frac{\sin 2x - \cos x}{4 \sin^2 x - 1} = \frac{\sin^2 x \cos x + \cos^3 x}{2 \sin x + 1}$

d.  $\frac{1}{1 - \sin \theta} = \frac{1 + \sin \theta}{\cos^2 \theta}$