Trig Identity Worksheet

Name:

Fr. C's Cheap Algebra Tricks

1. Multiply top and bottom by the conjugate (Recall how the conjugate of $a + bi$ is $a - bi$):

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

2. Factor the difference of perfect squares:

   (Recall $a^2 - b^2 = (a+b)(a-b)$)

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

3. Use the distributive property to factor out common terms:

   (Recall $ab + ac = a(b+c)$)

   $$\frac{\sin^2\theta - \sin^4\theta}{\cos^4\theta} = \tan^2\theta$$

4. Look for binomials squared to factor

   (Recall how $(a+b)^2 = a^2 + 2ab + b^2$):

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

5. Multiply top and bottom with a reciprocal function (like $\tan\theta$):

   $$\frac{\cot\theta + \tan\theta}{\cot\theta} = \sec^2\theta$$

6. Put everything on a common denominator:

   (Recall $\frac{a}{b} + \frac{c}{d} = \frac{ad+cb}{bd}$)

   $$\frac{\cot^2\theta}{\cos^2\theta} - \frac{1+\tan^2}{\sec^2} = \cot^2\theta$$