

Show all work and simplify all answers before circling/boxing them. If you do the problem incorrectly, or don't show sufficient work, you will be asked to rewrite the problem for full credit.

**Due next class.** Students who turn assignments in late (or do not attempt a problem) forfeit their ability to rewrite those problems for credit.

1. Prove  $\frac{1}{\sin(\theta)} - \sin(\theta) = \cot(\theta) \cos(\theta)$
2. Prove  $\frac{\cot A - 1}{\cot A + 1} = \frac{1 - \tan A}{1 + \tan A}$
3. Prove  $\sin^2 t - \cos^2 t = \frac{1 - \cot^2 t}{1 + \cot^2 t}$
4. Prove  $\frac{1 + \tan s}{1 - \tan s} = \frac{\sec^2 s + 2 \tan s}{2 - \sec^2 s}$
5. Prove  $\frac{\csc^4 \theta - \cot^4 \theta}{\csc^2 \theta + \cot^2 \theta} = 1$
6. Simplify  $-\cos^2(\theta) \sin^2(\theta) + (2 \sin(\theta) \cos(\theta))^2$
7. Factor  $2 \sec^2(\theta) - 2 \sec(\theta) - 8$