Practice Questions

[Remember FCSFC]

Identify the strategy or strategies (using numbers), by placing them in blank.

Formula Sheet(1)	Conversions (2)	Single Term (3)	Factoring (4)	Conjugate (5)
Use the formula sheet to substitute values. $\sin^2\theta + \cos^2\theta = 1$ is a good one to start with, as well as sidekicks, $\sin^2\theta = 1 - \cos^2\theta$, $\cos^2\theta = 1 - \sin^2\theta$.	Convert tanθ to $\frac{\sin\theta}{\cos\theta}$; cotθ to $\frac{\cos\theta}{\sin\theta}$, and often, reciprocals to primaries, i.e, $\frac{1}{\sec\theta}$ to cosθ	If there is a sum or difference of fractions, re-write as a single term.	Look for the possibility of re-writing an expression in factored form.	To simplify an expression, it may require the use of a conjugate. The conjugate of sinθ + 1 is sinθ - 1

Strategy used _____

1. Simplify $\dfrac{\cot\theta + \dfrac{1}{\sin\theta}}{\cos\theta + 1}$

Ans. _____

2. Simplify $\dfrac{\sec^4\theta - \sec^2\theta}{1 + \tan^2\theta}$

Strategy used ____

Ans. _____

3. Prove $\dfrac{\cos^2\theta}{1 - \sin^4\theta} = \dfrac{1}{1 + \sin^2\theta}$

Strategy used ____

Ans. _____

4. Simplify $\frac{\sin^2\theta + \cos^2\theta}{1+\tan\theta}$

Strategy used ___

Ans. _____

5. Prove $\frac{\sec\theta}{1-\cos\theta} = \frac{\sec\theta + 1}{\sin^2\theta}$

Strategy used ___

Ans. _____

Practice Questions Solutions

[Remember FCSFC]

Identify the strategy or strategies (using numbers), by placing them in blank.

Strategy _2 & 3_

1. Simplify $\dfrac{\cot\theta+\dfrac{1}{\sin\theta}}{\cos\theta+1}$

Ans. __cscθ___

$= \dfrac{\dfrac{\cos\theta}{\sin\theta}+\dfrac{1}{\sin\theta}}{\cos\theta+1}$ which equals $\dfrac{\dfrac{\cos\theta+1}{\sin\theta}}{\cos\theta+1}$ which equals $\dfrac{\cos\theta+1}{\sin\theta} X \dfrac{1}{\cos\theta+1}$

$= \dfrac{1}{\sin\theta}$ or cscθ

2. Simplify $\dfrac{\sec^4\theta-\sec^2\theta}{1+\tan^2\theta}$

Strategy _4 & 1_

Ans. __$\tan^2\theta$__

$= \dfrac{\sec^2\theta(\sec^2\theta-1)}{1+\tan^2\theta}$ which equals $\dfrac{\sec^2\theta(\sec^2\theta-1)}{\sec^2\theta}$ which equals $\sec^2\theta - 1$

$= tan^2\theta$

3. Prove $\frac{\cos^2\theta}{1-\sin^4\theta} = \frac{1}{1+\sin^2\theta}$ Strategy _4 & 1__

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

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

4. Simplify $\frac{\sin^2\theta+\cos^2\theta}{1+\tan\theta}$ Strategy 1,2,&3

Ans. $\frac{\cos\theta}{\cos\theta+\sin\theta}$

= $\frac{1}{1+\frac{\sin\theta}{\cos\theta}}$ which equals $\frac{1}{\frac{\cos\theta}{\cos\theta}+\frac{\sin\theta}{\cos\theta}}$

= $\frac{1}{\frac{\cos\theta+\sin\theta}{\cos\theta}}$ which equals $\frac{1}{1} X \frac{\cos\theta}{\cos\theta+\sin\theta}$

= [Which could also equal $1 + cot\theta$]

5. Prove $\frac{\sec\theta}{1-\cos\theta}=\frac{\sec\theta+1}{\sin^2\theta}$ Strategy _5&1_

Left Side

= $\frac{\sec\theta}{1-\cos\theta} X \frac{1+\cos\theta}{1+\cos\theta}$

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

= $\frac{\sec\theta+1}{\sin^2\theta}$ = Right Side