

Strategies for Simplifying Expressions Using Trig Identities

- Change the expression into sines and cosines.
- Look to use known formulas for purposes of situations.
- If there are fractions, find a common denominator.
- Use algebraic manipulations, like factoring, distributing...
- If a strategy or substitution isn't working... try something else.

Practice: p. 658 21-26 & 28-32

21. $\sec^3 \theta$	24. $\csc \theta$	28. $\cot^2 \theta$	31. 2
22. $\cos \theta$	25. 1	29. $\sec \theta$	32. $\cos^2 \theta$
23. $\csc \theta$	26. $-\cot \theta$	30. 1	

## Examples:

$$\tan \theta \cos^2 \theta$$

SOLUTION:

$$\begin{aligned} \tan \theta \cos^2 \theta &= \frac{\sin \theta}{\cos \theta} \cos^2 \theta \\ &= \sin \theta \cos \theta \end{aligned}$$

$$\csc^2 \theta - \cot^2 \theta$$

SOLUTION:

$$\begin{aligned} \csc^2 \theta - \cot^2 \theta &= (\cot^2 + 1) - \cot^2 \theta \\ &= \cot^2 + 1 - \cot^2 \theta \\ &= 1 \end{aligned}$$

$$\frac{\cos \theta \csc \theta}{\tan \theta}$$

SOLUTION:

$$\begin{aligned} \frac{\cos \theta \csc \theta}{\tan \theta} &= \frac{\cos \theta \frac{1}{\sin \theta}}{\tan \theta} \\ &= \frac{\cos \theta}{\sin \theta} \div \tan \theta \\ &= \frac{\cos \theta}{\sin \theta} \div \frac{\sin \theta}{\cos \theta} \\ &= \frac{\cos \theta}{\sin \theta} \times \frac{\cos \theta}{\sin \theta} \\ &= \left( \frac{\cos \theta}{\sin \theta} \right)^2 \\ &= \cot^2 \theta \end{aligned}$$

$$2 - 2\sin^2 \theta$$

SOLUTION:

$$\begin{aligned} 2 - 2\sin^2 \theta &= 2(1 - \sin^2 \theta) \\ &= 2\cos^2 \theta \end{aligned}$$