9.2 Trig Proofs Notes

What strategies can I use to prove trig expressions are equal?

Prove $\sec^2 x - \sin^2 x \sec^2 x = 1$

$1 + 2\tan^2 x = \sec^4 x - \tan^4 x$

$\csc x - \cot x = \dfrac{\sin x}{1 + \cos x}$

Summary

Guidelines for verifying trigonometric identities:

1) Your job is to prove one side of an identity is equal to the other so you will only work on one side of the identity, so…
2) Always work on the most complicated side and try to transform it to the simpler side. More complicated can mean the side that is "longer" or has more complicated expressions. Additions (or subtractions) are generally more complicated than multiplications.
3) If an expression can be multiplied out, do so.
4) If an expression can be factored, do so.
5) If you have a polynomial over a single term, you can "split it" into several fractions.
6) If you have an expression, that involves adding fractions, do so finding a lowest common denominator.
7) When in doubt, convert everything to sines and cosines.
8) Don't be afraid to create complex fractions. Once you do that, many problems are a step away from solution.
9) Always try something! You don't have to see the solution before you actually do the problem. Sometimes when you try something, the solution just evolves.