Verifying Identities

Verifying an identity means substituting a given trig value into both sides of an identitiy separately to make sure they are equal.

It is different than proving an identity. When we prove an identity we are showing it is true for all values, verifying is showing it is true for one value.

Note: When we verify an identity we do not arrange it or make substitutions. You **must** work with what you are given on each side.

Verify that $\theta = \frac{\pi}{4}$ is a solution: $\frac{\sin\theta + \cos\theta}{\sin\theta} = 1 + \cot\theta$

LHS

$\frac{\sin(\pi/4) + \cos(\pi/4)}{\sin(\pi/4)}$

$\frac{\frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}}$

$\frac{2\sqrt{2}}{2} \cdot \frac{2}{\sqrt{2}}$

2

RHS

$1 + \cot(\pi/4)$

$1 + 1$

2

scrap

$\tan(\pi/4)$

1

$\therefore \theta = \pi/4$ is a solution.

Verify that $\theta = 30°$ is a solution: $(\sec\theta)(1 + \cos\theta) = 1 + \sec\theta$

$LHS = (\sec 30)(1 + \cos 30)$

$= \left(\frac{2}{\sqrt{3}}\right)\left(\frac{2}{2} + \frac{\sqrt{3}}{2}\right)$

$= \left(\frac{2}{\sqrt{3}}\right)\left(\frac{2+\sqrt{3}}{2}\right)$

$= \frac{2+\sqrt{3}}{\sqrt{3}}$

$RHS = 1 + \sec 30$

$= 1 + \frac{2}{\sqrt{3}}$

$= \frac{\sqrt{3}}{\sqrt{3}} + \frac{2}{\sqrt{3}}$

$= \frac{\sqrt{3}+2}{\sqrt{3}}$

scrap

$\cos(30)$

$\frac{\sqrt{3}}{2}$

$\therefore \theta = 30°$ is a solution.