

$$28. \frac{\cot v - 1}{\cot v + 1} = \frac{1 - \tan v}{1 + \tan v}$$

LE R

$$\frac{\frac{1}{\tan v} - \frac{\tan v}{\tan v}}{\frac{1}{\tan v} + \frac{\tan v}{\tan v}} = \frac{\text{change to tan (unusual)}}{\text{(common denom)}}$$

$$\frac{\frac{1 - \tan v}{\tan v}}{\frac{1 + \tan v}{\tan v}} =$$

$$\frac{1 - \tan v}{\tan v} \cdot \frac{\tan v}{1 + \tan v} = \text{(mult by recip)}$$

$$\frac{1 - \tan v}{1 + \tan v} \checkmark$$

30.

$$\tan^2 \theta - \sin^2 \theta = \tan^2 \theta \sin^2 \theta$$

$$\frac{\sin^2 \theta}{\cos^2 \theta} - \sin^2 \theta =$$

$$\frac{\sin^2 \theta - \sin^2 \theta \cos^2 \theta}{\cos^2 \theta} = \text{(common denom)}$$

$$\frac{\sin^2 \theta (1 - \cos^2 \theta)}{\cos^2 \theta} = \text{(factor out } \sin^2 \theta)$$

$$\frac{\sin^2 \theta (\sin^2 \theta)}{\cos^2 \theta} = \text{Pyth. Id.}$$

$$\tan^2 \theta \sin^2 \theta \checkmark$$

32. $\tan^4 t + \tan^2 t = \sec^4 t - \sec^2 t$

$\Rightarrow \mathbb{R}$

$$\tan^2 t (\tan^2 t + 1) =$$

$$\tan^2 t (\sec^2 t) =$$

$$(\sec^2 t - 1)(\sec^2 t) =$$

$$\sec^4 t - \sec^2 t \quad \checkmark$$

[very common problem]

34. $\frac{1 - \cos \theta}{\sin \theta} = \frac{\sin \theta}{1 + \cos \theta}$

$\Rightarrow \mathbb{R}$

+ can do
either side

$$\frac{1 - \cos \theta}{\sin \theta} \cdot \frac{1 + \cos \theta}{1 + \cos \theta} =$$

(mult by
conjugate)

(foil
top)

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

Pyth. 12 $\rightarrow$

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

$$\frac{\sin \theta}{1 + \cos \theta} \quad \checkmark$$

3b. $\frac{\sin t}{1+\cos t} + \frac{1+\cos t}{\sin t} = 2 \csc t$

$L \Rightarrow R$

(common denominator) $\frac{\sin t (\sin t)}{(1+\cos t)(\sin t)} + \frac{1+\cos t (1+\cos t)}{(1+\cos t)(\sin t)} =$

$\frac{\sin^2 t + 1 + 2\cos t + \cos^2 t}{(1+\cos t)(\sin t)} =$

①

$\frac{2 + 2\cos t}{(1+\cos t) \sin t} =$

$\frac{2(1+\cos t)}{(1+\cos t) \sin t} =$

$2 \csc t \checkmark$