

$$24. \frac{\sec\theta - 1}{1 - \cos\theta} = \sec\theta$$

$$\frac{\sec\theta - 1}{1 - \cos\theta} \cdot \frac{1 + \cos\theta}{1 + \cos\theta}$$

multiply by conjugate
to get a pythagorean
identity

$$\frac{(\sec\theta - 1)(1 + \cos\theta)}{1 - \cos^2\theta} \leftarrow \text{use a pythagorean identity}$$

$$\frac{(\sec\theta - 1)(1 + \cos\theta)}{\sin^2\theta} \leftarrow \text{FOIL numerator}$$

$$\frac{\sec\theta - 1 + \sec\theta \cos\theta - \cos\theta}{\sin^2\theta} \leftarrow \text{simplify}$$

$$\frac{\sec\theta - \cos\theta}{\sin^2\theta} \leftarrow \text{Rewrite } \sec\theta \text{ in terms of } \cos\theta$$

$$\frac{\frac{1}{\cos\theta} - \cos\theta}{\sin^2\theta}$$

find common denominator ;

$$\frac{\frac{1 - \cos^2\theta}{\cos\theta}}{\sin^2\theta}$$

use ~~pyth~~ pythagorean identity

$$\frac{\sin^2\theta}{\cos\theta} \cdot \frac{1}{\cancel{\sin^2\theta}}$$

simplify

$$\frac{1}{\cos\theta}$$

rewrite

24. Alternate Method

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

$$\frac{\frac{1}{\cos \theta} - 1}{1 - \cos \theta}$$

rewrite $\sec \theta$

$$\frac{\frac{1 - \cos \theta}{\cos \theta}}{1 - \cos \theta}$$

find common denominator

$$\frac{\cancel{1 - \cos \theta}}{\cos \theta} \cdot \frac{1}{\cancel{1 - \cos \theta}}$$

simplify

$$\frac{1}{\cos \theta}$$

rewrite

$$\sec \theta$$