Warm-up #5: Simplifying

FOIL

1. $(\csc\theta + \cot\theta)(1 - \cos\theta)$

$\csc\theta - \csc\theta\cos\theta + \cot\theta - \cot\theta\cos\theta$

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

$\csc\theta - \frac{\cos\theta}{\sin\theta} + \cot\theta - \frac{\cos^2\theta}{\sin\theta}$

$\csc\theta - \cancel{\cot\theta} + \cancel{\cot\theta} - \frac{\cos^2\theta}{\sin\theta}$

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

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

$\frac{\sin^2\theta}{\sin\theta}$

$\boxed{\sin\theta}$

2. $\frac{1+\csc\theta}{\sec\theta}$

$\frac{1}{\sec\theta} + \frac{\csc\theta}{\sec\theta}$

$\cos\theta + \frac{\cos\theta}{\sin\theta}$

$\boxed{\cos\theta + \cot\theta}$

yucky!!

$\frac{2}{3} + \frac{8}{3} = \frac{2+8}{3}$

$\frac{\csc\theta}{\sec\theta} = \frac{\frac{1}{\sin\theta}}{\frac{1}{\cos\theta}}$ K C F

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