Warm Up
Prove the following identities:

$$
\begin{aligned}
& \tan \theta+\tan ^{3} \theta=\frac{1}{\cot \theta \cos ^{2} \theta} \\
& \begin{array}{l|c}
\tan \theta\left(1+\tan ^{2} \theta\right) & \frac{1}{\frac{\cos \theta}{\sin \theta} \cdot \cos ^{2} \theta} \\
\frac{\sin \theta}{\cos \theta} \cdot \sec ^{2} \theta & \frac{1}{\frac{\cos ^{3} \theta}{\sin \theta}} \\
\frac{\sin \theta}{\cos \theta} \cdot \frac{1}{\cos ^{2} \theta} & 1 \cdot \frac{\sin \theta}{\cos ^{3} \theta} \\
\frac{\sin \theta}{\cos ^{3} \theta} & \frac{\sin \theta}{\cos ^{3} \theta}
\end{array} \\
& \begin{array}{c}
\tan \theta+\tan ^{3} \theta=\frac{1}{\cot \theta \cos ^{2} \theta} \\
\tan \theta\left(1+\tan ^{2} \theta\right)\left(\frac{1}{\cot \theta)\left(\frac{1}{\cos ^{2} \theta}\right)}\right. \\
\tan \theta \sec ^{2} \theta
\end{array}
\end{aligned}
$$

Questions from homework

$$
\begin{aligned}
& \text { (c) } \sin ^{2} \theta+2 \cos ^{2} \theta-1=\cos ^{2} \theta \\
& \text { group } \cos ^{2} \theta \\
& \text { liketans } \cos ^{2} \theta-\cos ^{2} \theta \quad 1-\sin ^{2} \theta
\end{aligned}
$$

(II)

$$
\begin{aligned}
& \frac{1+2 \sin \theta \cos \theta}{\sin \theta+\cos \theta}<\frac{\sin \theta+\cos \theta}{1} \\
& 1+2 \sin \theta \cos \theta
\end{aligned} \left\lvert\, \begin{aligned}
& \left(\begin{array}{l}
\sin \theta+\cos \theta)(\sin \theta+\cos \theta) \\
\frac{\sin ^{2} \theta+2 \sin \theta \cos \theta+\cos ^{2} \theta}{1+2 \sin \theta \cos \theta}
\end{array}\right.
\end{aligned}\right.
$$



Homework
(3) $\cos \theta+\tan \theta \sin \theta=\sec \theta$

$$
\begin{array}{c|c}
\cos \theta+\left(\frac{\sin \theta}{\cos \theta}\right) \sin \theta & \frac{1}{\cos \theta} \\
\frac{\cos \theta}{1}+\frac{\sin ^{2} \theta}{\cos \theta} \\
\frac{\cos ^{2} \theta+\sin ^{2} \theta}{\cos \theta} \\
\frac{1}{\cos \theta}
\end{array}
$$

