

Section 5.1 / 3, 7, 13, 19, 25, 31

Homework

MTH30

#3

$$\tan(-x) \cos x = -\sin x \quad \text{verify}$$

$$\tan(-x) \cos x = -\tan(x) \cos x = -\frac{\sin x}{\cos x} \cdot \cos x = -\sin x$$

odd tan x



#7

$$\sec x - \sec x \sin^2 x = \cos x$$

$$\sec x - \sec x \sin^2 x = \sec x (1 - \sin^2 x) = \sec x (\cos^2 x) =$$

$$= \frac{1}{\sec x} \cdot \cos^2 x = \cos^2 x$$



#13

$$\frac{\tan \theta \cdot \cot \theta}{\csc \theta} = \sin \theta$$

$$\frac{\tan \theta \cdot \cot \theta}{\csc \theta} = \frac{\frac{\sin \theta}{\cos \theta} \cdot \frac{\cos \theta}{\sin \theta}}{\frac{1}{\sin \theta}} = \frac{\sin \theta}{1} = \sin \theta$$



#19

$$\frac{\csc^2 t}{\cot t} = \csc t \cdot \sec t$$

$$\csc^2 t \rightarrow \left( \frac{1}{\sin^2 t} \right) = \frac{1}{\cancel{\csc t}} \cdot \frac{1}{\csc t}$$

$$\cot t \rightarrow \left( \frac{\cos t}{\sin t} \right) = \frac{1}{\cancel{\sin t}} \cdot \frac{\sin t}{\csc t} = \frac{1}{\sin t \cdot \csc t}$$

Yes



#25

$$\frac{\sin t}{\csc t} + \frac{\cos t}{\sec t} = 1$$

$$\frac{\sin t}{\csc t} + \frac{\cos t}{\sec t} = \frac{\sin t}{\frac{1}{\sin t}} + \frac{\cos t}{\frac{1}{\cos t}} = \sin^2 t + \cos^2 t = 1$$

#31

$$\frac{\cos x}{1 - \sin x} + \frac{1 - \sin x}{\cos x} = 2 \sec x$$

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

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

$$\cos^2 x + \sin^2 x = 1$$

$$= \frac{2(1 - \sin x)}{(1 - \sin x) \cos x} = \frac{2}{\cos x} = 2 \sec x$$