Section 5.2
p. 460
16-21

Note Title 2/14/2012

RIGHT → LEFT

16. $\tan x + \sec x = \dfrac{\cos x}{1-\sin x}$ (multiply by conjugate)

$= \dfrac{\cos x}{1-\sin x} \cdot \dfrac{(1+\sin x)}{1+\sin x}$

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

$= \dfrac{\cancel{\cos x}(1+\sin x)}{\cos^{\cancel{2}} x}$ = (split up Numerator)

$= \dfrac{1}{\cos x} + \dfrac{\sin x}{\cos x}$

$= \sec x + \tan x$ ✓

LEFT → RIGHT

17. $\dfrac{\cos^2 x - 1}{\cos x} = -\tan x \sin x$

$\dfrac{-\sin^2 x}{\cos x} =$

$-\dfrac{\sin x}{\cos x} \cdot \sin x$

$= -\tan x \sin x$ ✓

$\cancel{\sin^2 x} + \cos^2 x = 1$
$-\cancel{\sin^2 x}$ -1 -1 $-\sin^2 x$

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

18. $\dfrac{\sec^2\theta - 1}{\sin\theta} = \dfrac{\sin\theta}{1-\sin^2\theta}$

L→R

$\dfrac{\tan^2\theta}{\sin\theta} =$

$\dfrac{\sin^2\theta}{\cos^2\theta} \cdot \dfrac{1}{\sin\theta} =$

$\dfrac{\sin\theta}{\cos^2\theta} =$

Pyth. Identity

$\dfrac{\sin\theta}{1-\sin^2\theta}$ ✓

19. LEFT→RIGHT

$(1-\sin\beta)(1+\csc\beta) = 1-\sin\beta+\csc\beta-\sin\beta\csc\beta$

(JUST FOIL)

$= 1+\csc\beta-\sin\beta-\sin\beta\csc\beta$ ✓

LEFT → RIGHT

20. $\frac{1}{1-\cos x} + \frac{1}{1+\cos x} = 2\csc^2 x$

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

$= \frac{2}{1-\cos^2 x}$

$= \frac{2}{\sin^2 x}$

$= 2\csc^2 x$ ✓

$(a-b)^2 = a^2 - 2ab + b^2$

LEFT → RIGHT

21. $(\cos t - \sin t)^2 + (\cos t + \sin t)^2 = 2$

(FOIL) $= \cos^2 t - 2\cos t \sin t + \sin^2 t + \cos^2 t + 2\cos t \sin t + \sin^2 t$

$= 2\cos^2 t + 2\sin^2 t$

$= 2(\cos^2 t + \sin^2 t)$

$= 2(1)$

$= 2$ ✓