Tuesday, October 30, 2018 8:25 AM

D.2 Notes (5.2 in bk): Verifying Trig Identities

① $\dfrac{\csc^2 x - 1}{\csc^2 x} = \cos^2 x$

only change this side

$\dfrac{\cot^2 x}{\csc^2 x}$

$\dfrac{\dfrac{\cos^2 x}{\sin^2 x}}{\dfrac{1}{\sin^2 x}}$

$\dfrac{\cos^2 x}{\cancel{\sin^2 x}} \cdot \dfrac{\cancel{\sin^2 x}}{1}$

$\cos^2 x = \cos^2 x$ ✓

$1 + \cot^2 x = \csc^2 x$

$-1 \qquad -1$

$\cot^2 x = \csc^2 x - 1$

② $2\csc x = \dfrac{1}{\csc x + \cot x} + \dfrac{1}{\csc x - \cot x}$ *need common den.

$\left(\dfrac{\csc x - \cot x}{\csc x - \cot x}\right)$ $\left(\dfrac{\csc x + \cot x}{\csc x + \cot x}\right)$

$\dfrac{\csc x - \cancel{\cot x} + \csc x + \cancel{\cot x}}{\csc^2 x - \cot^2 x}$

$\dfrac{2\csc x}{\csc^2 x - (\csc^2 x - 1)}$

$\dfrac{2\csc x}{\cancel{\csc^2 x} - \cancel{\csc^2 x} + 1}$

	$\csc x$	$\cot x$
$\csc x$	$\csc^2 x$	
$-\cot x$		$-\cot^2 x$

$1 + \cot^2 x = \csc^2 x$

$-1 \qquad -1$

$\cot^2 x = \csc^2 x - 1$

$$\frac{2\csc x}{1}$$

$$2\csc x = 2\csc x \quad \checkmark$$

③ $\dfrac{\sin\theta}{1-\cos\theta} = \csc\theta + \cot\theta$

$\left(\dfrac{1+\cos\theta}{1+\cos\theta}\right)$

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

$$\frac{\sin\theta(1+\cos\theta)}{\sin^2\theta}$$

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

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

separate fraction

$$\csc\theta + \cot\theta = \csc\theta + \cot\theta \quad \checkmark$$

* multiply by the conjugate

	1	$-\cos\theta$
1	1	
$\cos\theta$		$-\cos^2\theta$

$$\sin^2\theta + \cos^2\theta = 1$$
$$-\cos^2\theta \quad -\cos^2\theta$$
$$\sin^2\theta = 1-\cos^2\theta$$

Homework: pg. 324 2-12 (even)