5-2-1 Verifying Identities

Verify - prove something is true

Verify Identities -

PROVE both sides of an equation are equal by

WORKING ON ONE SIDE

until the left & Right are equal

NO EQUALITY RULES

multiply both sides by 3

add 7 to both sides

square root both sides

* Start w/ complicated side
* change to sin / cos
* pythagorean Identities 1 & trig^2
* Combine fraction common den.
* multiply numerator & denominator by the conjugate of the denominator

eliminate fractions

5-2-1 Verifying Equations

verify

Ex1 $\frac{\csc^2 x - 1}{\csc^2 x} = \cos^2 x$

Start on Complicated side

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

$-1 \quad -1$

sines/cosines

$\frac{\cot^2 x}{\csc^2 x} = \cos^2 x$

$\frac{\left(\frac{\cos^2 x}{\sin^2 x}\right)}{\left(\frac{1}{\sin^2 x}\right)} = \cos^2 x$ ✓

$\cos^2 x = \cos^2 x$ ← Last Line

Ex2 Combing Fractions

$2\csc x = \frac{1}{\csc x + \cot x} + \frac{1}{\csc x - \cot x}$

C.D add

$= \frac{\csc x - \cot x + \csc x + \cot x}{\csc^2 x - \cot^2 x}$

$(A+B)(A-B)$

$A^2 - B^2$

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

$-\cot^2 \qquad -\cot$

$\boxed{2\csc x = \frac{2\csc x}{1}}$ ✓

Ex3 Conjugate

Verify $\frac{\sin x}{1-\cos x} = \csc x + \cot x$

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

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

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

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

$\csc x + \cot x = \csc x + \cot x$

324: 1, 3, 4, 7, 8, 15, 16, 66-68