Name : _____

Verify - Pythagorean Identities

Verify the following.

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

2) $\frac{1 - \cos x}{\sin x} + \frac{si}{1 -}$

3) $\cot^4 x + \cot^2 x$

Name : _____

Verify - Pythagorean Identities

Verify the following.

4) $(1 - \sin^2 x) \tan (90^0 - x) = \cos^3 x \csc x$

5) $1 - 2 \sin^2 x + si$

6) $\dfrac{\sec^2 x - \sin^2 x -}{\cot x}$

Name : _____

Answer key

Sheet 1

Verify - Pythagorean Identities

Verify the following.

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

$-\cos x + \sec x = -\cos x + \dfrac{1}{\cos x}$ — Using reciprocal identity

$= \dfrac{-\cos^2 x + 1}{\cos x}$ — Combine quotients

$= \dfrac{\sin^2 x}{\cos x}$ — Using Pythagorean identity

2) $\dfrac{1 - \cos x}{\sin x} + \dfrac{si}{1 -}$

$\dfrac{1 - \cos x}{\sin x} + \dfrac{s}{1 -}$ — quotients

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

hagorean identity

t 2 & cancel the factors

iprocal identity

3) $\cot^4 x + \cot^2 x = \csc^4 x - \csc^2 x$

$\cot^4 x + \cot^2 x = \cot^2 x (\cot^2 x + 1)$ — Factor out $\cot^2 x$

$= (\csc^2 x - 1)\csc^2 x$ — Using Pythagorean identities

$= \csc^4 x - \csc^2 x$ — Multiply

Name : _____

Answer key

Verify - Pythagorean Identities

Verify the following.

4) $(1 - \sin^2 x) \tan (90^0 - x) = \cos^3 x \csc x$

$(1 - \sin^2 x) \tan (90^0 - x) = \cos^2 x \cot x$ — Using Pythagorean & cofunction identities

$= \cos^2 x \dfrac{\cos x}{\sin x}$ — Using quotient identity

$= \cos^3 x \csc x$ — Using reciprocal identity

5) $1 - 2 \sin^2 x + si$

$1 - 2 \sin^2 x + si$ $)^2 = a^2 - 2ab + b^2$

agorean identity

6) $\dfrac{\sec^2 x - \sin^2 x}{\cot x}$

$\dfrac{\sec^2 x - \sin^2 x}{\cot x}$

$= \dfrac{\sec^2 x - 1}{\cot x}$ — Using Pythagorean identity

$= \dfrac{\tan^2 x}{\cot x}$ — Using Pythagorean identity

$= \tan^3 x$ — Using reciprocal identity