

Verify - Pythagorean Identities

Verify the following.

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

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

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

PREVIEW

Gain complete access to the largest
collection of worksheets in all subjects!

Members, please
log in to
download this
worksheet.

Not a member?
Please sign up to
gain complete
access.

www.mathworksheets4kids.com

Name : _____

Verify - Pythagorean Identities

Verify the following.

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

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

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

PREVIEW

Gain complete access to the largest
collection of worksheets in all subjects!

Members, please
log in to
download this
worksheet.

Not a member?
Please sign up to
gain complete
access.

www.mathworksheets4kids.com

Verify - Pythagorean Identities

Verify the following.

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

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

Using reciprocal identity

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

Combine quotients

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

Using Pythagorean identity

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

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

PREVIEW

Gain complete access to the largest
collection of worksheets in all subjects!

Members, please
log in to
download this
worksheet.

Not a member?
Please sign up to
gain complete
access.

www.mathworksheets4kids.com

quotients

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

Pythagorean identity

Factor out 2 & cancel the
factors

reciprocal identity

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

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

Factor out $\cot^2 x$

$$= (\csc^2 x - 1)\csc^2 x$$

Using Pythagorean identities

$$= \csc^4 x - \csc^2 x$$

Multiply

Verify - Pythagorean Identities

Verify the following.

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

$$(1 - \sin^2 x) \tan(90^\circ - x) = \cos^2 x \cot x$$

Using Pythagorean & cofunction identities

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

Using quotient identity

$$= \cos^3 x \csc x$$

Using reciprocal identity

5) $1 - 2 \sin^2 x + \sin^4 x$

$$1 - 2 \sin^2 x + \sin^4 x$$

PREVIEW
Gain complete access to the largest collection of worksheets in all subjects!

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

Pythagorean identity

Members, please log in to download this worksheet.

Not a member? Please sign up to gain complete access.

www.mathworksheets4kids.com

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

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

$$= \frac{\sec^2 x - 1}{\cot x}$$

Using Pythagorean identity

$$= \frac{\tan^2 x}{\cot x}$$

Using Pythagorean identity

$$= \tan^3 x$$

Using reciprocal identity