

Name : _____

Verify - Fundamental Identities

Sheet 1

Verify the following.

1) $\csc x \tan x = \sec x$

2) $\csc^2 x + \sec^2 x$

3) $\frac{\sin^2(90^\circ - x)}{\cot x}$

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Verify - Fundamental Identities

Verify the following.

4) $\sin x \sec x = \tan x$

5) $\frac{1}{\sin x \cot x} =$

6) $(\sec^2 x - 1) \cot x =$

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Verify - Fundamental Identities

Verify the following.

1) $\csc x \tan x = \sec x$

$$\csc x \tan x = \frac{1}{\sin x} \frac{\sin x}{\cos x}$$

Using reciprocal & quotient identities

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

Cancel the common factors

$\csc x$

Using reciprocal identity

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2) $\csc^2 x + \sec^2 x$

$\csc^2 x$

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Using reciprocal identities

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Using quotient identities

Using Pythagorean identity

Using reciprocal identities

3) $\frac{\sin^2(90^\circ - x) + \sin^2 x}{\cot x}$

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$$\frac{\sin^2(90^\circ - x) + \sin^2 x}{\cot x} = \frac{\cos^2 x + \sin^2 x}{\cot x}$$

Using cofunction identity

$$= \frac{1}{\cot x}$$

Using Pythagorean identity

$$= \tan x$$

Using reciprocal identity

Verify - Fundamental Identities

Verify the following.

4) $\sin x \sec x = \tan x$

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

Using reciprocal identity

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

Multiply

$$= \tan x$$

Using quotient identity

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5) $\frac{1}{\sin x \cot x} =$

$$\frac{1}{\sin x}$$

Using reciprocal identity

Common factors

Quotient identity

6) $(\sec^2 x - 1) \cos^2 x = \sin^2 x$

$$(\sec^2 x - 1) \cos^2 x$$

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

Using quotient identity

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

Cancel the common factors

$$= \sin^2 x$$