

5.4 Prove Trig Identities Worksheet

This document was composed and formatted by Annie Bernatchez.

The course material originated from www.jensenmath.ca

Prove each identity using the space on the following pages.

a) $\sin(x + y) = \sin x \cos y + \cos x \sin y$

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b) $\tan(x - y) = \frac{\tan x - \tan y}{1 + \tan x \tan y}$

LS	RS

c) $\sin(2x) = 2 \sin x \cos x$

LS	RS

d) $\cos(2x) = \cos^2 x - \sin^2 x$

LS	RS

e) $\cot \theta - \tan \theta = 2 \cot(2\theta)$

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f) $\frac{\sin(2\theta)}{1 - \cos(2\theta)} = \cot \theta$

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

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

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i) $\frac{\sec \theta - 1}{1 - \cos \theta} = \sec \theta$

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j) $\frac{\sin x - \cos x}{\cos x} + \frac{\sin x + \cos x}{\sin x} = \sec x \csc x$

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k) $\frac{1 - \sin^2 x \cos^2 x}{\cos^4 x} = \tan^4 x + \tan^2 x + 1$

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

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m) $\cot \theta - \tan \theta = 2 \cot(2\theta)$

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n) $(\sin x + \cos x)^2 = 1 + \sin(2x)$

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

LS	RS

p) $\sin\left(\frac{\pi}{4} + x\right) + \sin\left(\frac{\pi}{4} - x\right) = \sqrt{2} \cos x$

LS	RS

q) $\cos^4 x - \sin^4 x = \cos(2x)$

LS	RS

r) $\csc(2x) + \cot(2x) = \cot x$

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s) $\cos(2x) = 2 \cos^2 x - 1$

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t) $\sin\left(\frac{3\pi}{2} - x\right) = -\cos x$

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

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v) $\cot x + \tan x = 2 \csc(2x)$

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