

Pre-Cal Chapter 7 Trigonometric Identities and Inverse Functions Sample Test Problems

Lesson 211 | Precalculus | Fundamental trigonometric identities • Inverse trigonometric functions • Trigonometric equations

<https://www.youtube.com/watch?v=txBxEJ6iv1s>

Related review: exact coverage needs teacher confirmation.

Name: _____ Date: _____ Show your reasoning.

01

Simplify $9(1 - \cos^2 \theta) + 63\sin^2 \theta$ and name the identity.

02

Let $\theta = \arctan(5/11)$ using the principal value. Find exact $\sin \theta$ and $\cos \theta$, and state its quadrant.

03

Solve $5\sin(2x) - 5/2 = 0$ for $0 \leq x < 2\pi$. Give an exact formula listing all roots.

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04

Simplify $4(1 - \cos^2 \theta) + 44\sin^2 \theta$ and name the identity.

05

Let $\theta = \arctan(13/9)$ using the principal value. Find exact $\sin \theta$ and $\cos \theta$, and state its quadrant.

06

Solve $7\sin(4x) - 7/2 = 0$ for $0 \leq x < 2\pi$. Give an exact formula listing all roots.

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01 Simplify $9(1-\cos^2 \theta)+63\sin^2 \theta$ and name the identity.

Use $1-\cos^2 \theta=\sin^2 \theta$. Result $(9+63)\sin^2 \theta=72\sin^2 \theta$; valid for every real θ .

02 Let $\theta=\arctan(5/11)$ using the principal value. Find exact $\sin \theta$ and $\cos \theta$, and state its quadrant.

The ratio is positive, so $0<\theta<\pi/2$. Use opposite 5, adjacent 11, hypotenuse $\sqrt{146}$. $\sin \theta=5\cdot\sqrt{(146)}/146$; $\cos \theta=11\cdot\sqrt{(146)}/146$.

03 Solve $5\sin(2x)-5/2=0$ for $0\leq x<2\pi$. Give an exact formula listing all roots.

$\sin(2x)=1/2$. Thus $x=(\pi/6+2k\pi)/2$ or $x=(5\pi/6+2k\pi)/2$, $k=0,1,\dots,1$. There are 4 roots in the interval.

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04

Simplify $4(1-\cos^2 \theta)+44\sin^2 \theta$ and name the identity.

Use $1-\cos^2 \theta=\sin^2 \theta$. Result $(4+44)\sin^2 \theta=48\sin^2 \theta$; valid for every real θ .

05

Let $\theta=\arctan(13/9)$ using the principal value. Find exact $\sin \theta$ and $\cos \theta$, and state its quadrant.

The ratio is positive, so $0<\theta<\pi/2$. Use opposite 13, adjacent 9, hypotenuse $\sqrt{250}$. $\sin \theta=13\cdot\sqrt{(10)/50}$; $\cos \theta=9\cdot\sqrt{(10)/50}$.

06

Solve $7\sin(4x)-7/2=0$ for $0\leq x<2\pi$. Give an exact formula listing all roots.

$\sin(4x)=1/2$. Thus $x=(\pi/6+2k\pi)/4$ or $x=(5\pi/6+2k\pi)/4$, $k=0,1,\dots,3$. There are 8 roots in the interval.