Topic 8.1 Solving Trigonometric Equations Using Inverses

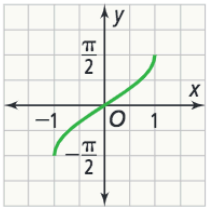
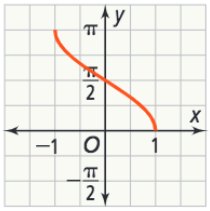
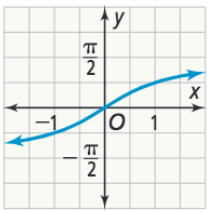
Essential Question:

How can you use an inverse function to find all the solutions of a trigonometric equation?

Explore and Reason

Complete online

CONCEPT: Define Inverse Trigonometric Functions

	Inverse sine	Inverse cosine	Inverse tangent
FUNCTION	$y = \sin^{-1} x$	$y = \cos^{-1} x$	$y = \tan^{-1} x$
DOMAIN	$[-1, 1]$	$[-1, 1]$	$(-\infty, \infty)$
RANGE	$\left[\frac{-\pi}{2}, \frac{\pi}{2}\right]$	$[0, \pi]$	$\left(\frac{-\pi}{2}, \frac{\pi}{2}\right)$
GRAPHS			

NOTES:

Examples & Questions

Examples 1

Q: Is there more than one way to restrict the domain of $y = \sin x$ so the function has a valid inverse function?

Examples 2

Q: What do you know about the value of $\sin^{-1}(\frac{1}{2})$?

Q: What is another way to determine the value of $\sin^{-1}(\frac{1}{2})$?

Examples 3

Q: Why do you need to check that your calculator has the correct units of measure selected?

Q: Why do you add (360°)k to two angles to identify all angles with the cosine value in Part A, but add (180°)k to only one value to identify all angles with the tangent value in Part B?

Examples 4

Q: How is solving the trigonometric equation in the example similar to solving a linear equation?

Q: How do you now if you made an error isolating the sine function?

Examples 5

Q: How is one year represented in this function?

Q: Why is looking at a graph helpful when answering this question?

Q: How do you know if the angle in the express $\cos\left(\frac{\pi x}{6}\right)$ is measured in radians or degrees?

Practice and Problem Solving

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Lesson Quiz 8.1