

Section 8.2

The Inverse Trigonometric Functions (Continued)

OBJECTIVE 1

- 1 ✓ Find the Exact Value of Expressions Involving the Inverse Sine, Cosine, and Tangent Functions

EXAMPLE

Finding the Exact Value of Expressions Involving Inverse Trigonometric Functions

Find the exact value of: $\cos^{-1}\left(\cos\frac{7\pi}{6}\right)$

EXAMPLE

Finding the Exact Value of Expressions Involving Inverse Trigonometric Functions

Find the exact value of: $\cos\left(\tan^{-1}\frac{3}{4}\right)$

EXAMPLE

Finding the Exact Value of Expressions Involving Inverse Trigonometric Functions

Find the exact value of: $\tan\left(\sin^{-1}\left(-\frac{2}{5}\right)\right)$

OBJECTIVE 2

- 2 Know the Definition of the Inverse Secant, Cosecant, and Cotangent Functions

$$y = \sec^{-1} x \text{ means } x = \sec y \quad (1)$$

where $|x| \geq 1$ and $0 \leq y \leq \pi$, $y \neq \frac{\pi}{2}$ *

$$y = \csc^{-1} x \text{ means } x = \csc y \quad (2)$$

where $|x| \geq 1$ and $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$, $y \neq 0$ †

$$y = \cot^{-1} x \text{ means } x = \cot y \quad (3)$$

where $-\infty < x < \infty$ and $0 < y < \pi$

EXAMPLE

Finding the Exact Value of an Inverse Cosecant Function

Find the exact value of: $\csc^{-1}\left(-\frac{2\sqrt{3}}{2}\right)$

OBJECTIVE 3

- 3 Use a Calculator to Evaluate $\sec^{-1} x$, $\csc^{-1} x$, and $\cot^{-1} x$

EXAMPLE

Approximating the Value of Inverse Trigonometric Functions

Use a calculator to approximate each expression in radians rounded to two decimal places.

(a) $\sec^{-1} 5$

(b) $\csc^{-1}\left(-\frac{4}{3}\right)$

(c) $\cot\left(\frac{\sqrt{3}}{3}\right)$

(d) $\cot^{-1}\left(-\frac{2}{3}\right)$

OBJECTIVE 4

- 4 Write a Trigonometric Expression as an Algebraic Expression

EXAMPLE

Writing a Trigonometric Expression as an Algebraic Expression

Write $\cos(\sin^{-1} u)$ as an algebraic expression containing u .