

4 Find the Inverse Function of a Trigonometric Function

$$y = 3x + 1$$

$$x = 3y + 1$$

$$y = \frac{x-1}{3}$$

EXAMPLE

$$x - 1 = 3y$$

Finding the Inverse Function of a Trigonometric Function

Find the inverse function f^{-1} of $f(x) = 3 \cos x + 1$, $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$.

Find the range of f and the domain and range of f^{-1} .

$$f(x) = 3 \cos x + 1$$

$$y = 3 \cos x + 1$$

$$x = 3 \cos y + 1$$

$$x - 1 = 3 \cos y$$

$$\frac{x-1}{3} = \cos y$$

$$\cos^{-1} \left(\frac{x-1}{3} \right) = y$$

$$f^{-1}(x) = \cos^{-1} \left(\frac{x-1}{3} \right)$$

$$f \quad \mathbb{R} \quad [-1, 1]$$

$$[3, 3]$$

$$[-2, 4] : \mathbb{R} \quad f$$

$$f^{-1} \quad D: [-2, 4]$$

$$R: \left[-\frac{\pi}{2}, \frac{\pi}{2} \right]$$

5 Solve Equations Involving Inverse Trigonometric Functions

EXAMPLE

Solving an Equation Involving an Inverse Trigonometric Function

Solve the equation: $2 \cos^{-1} x = \frac{\pi}{2}$

$$\cos^{-1} x = \frac{\pi}{4}$$

$$\cos \frac{\pi}{4} =$$

$$x = \frac{\sqrt{2}}{2}$$

Name

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