

Precalculus, Section 7.1, #68  
The Inverse Sine, Cosine, and Tangent Functions

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Find the exact solution of the equation.<sup>1</sup>

$$5 \sin^{-1}(x) - 2\pi = 2 \sin^{-1}(x) - 3\pi$$

Let's collect like terms

$$5 \sin^{-1}(x) - 2\pi = 2 \sin^{-1}(x) - 3\pi$$

$$3 \sin^{-1}(x) = -\pi$$

$$\sin^{-1}(x) = -\frac{\pi}{3}$$

We complete the solution using our knowledge of the unit circle and the domain of the inverse sine function. We need the number  $x$  with  $-1 \leq x \leq 1$  and  $\sin\left(-\frac{\pi}{3}\right) = x$ .

Thus  $x = -\frac{\sqrt{3}}{2}$ .

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<sup>1</sup>Sullivan, *Precalculus: Enhanced with Graphing Utilities*, p. 451, #68.