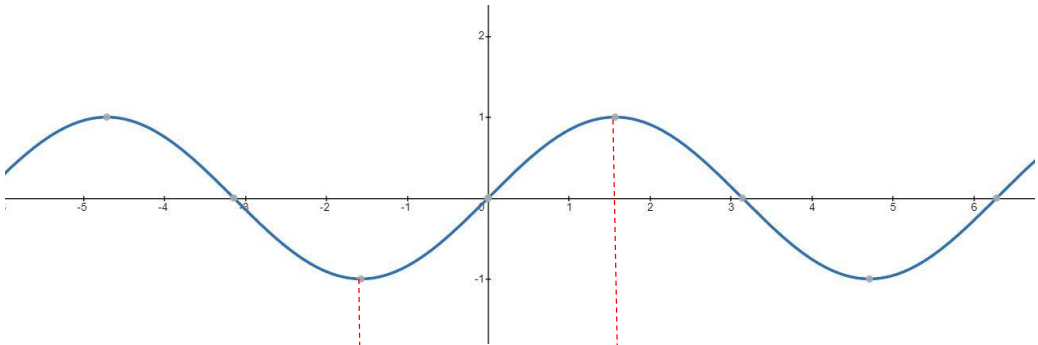
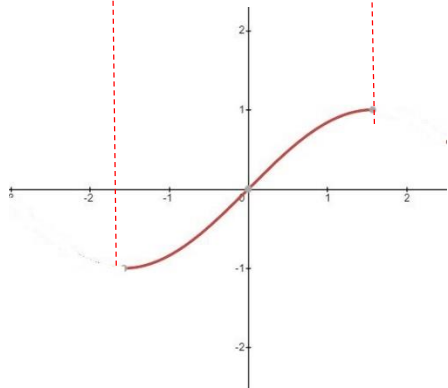


$y = \sin x$ 의 역함수가 존재하는가?

일대일 함수가 아니므로 역함수가 존재하지 않는다.
일대일 함수로 만들기 위해서 정의역을 축소한다.



$-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$ 로 축소



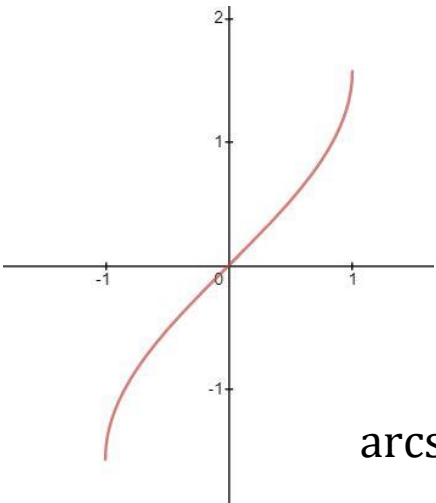
$$\sin^{-1}(0.7) = ?$$

$$\nexists \sin^{-1}(1.4)$$

$$= \arcsin x$$

$$y = \sin^{-1} x \quad (-1 \leq x \leq 1, \quad -\frac{\pi}{2} \leq y \leq \frac{\pi}{2})$$

$$\neq \frac{1}{\sin x}$$



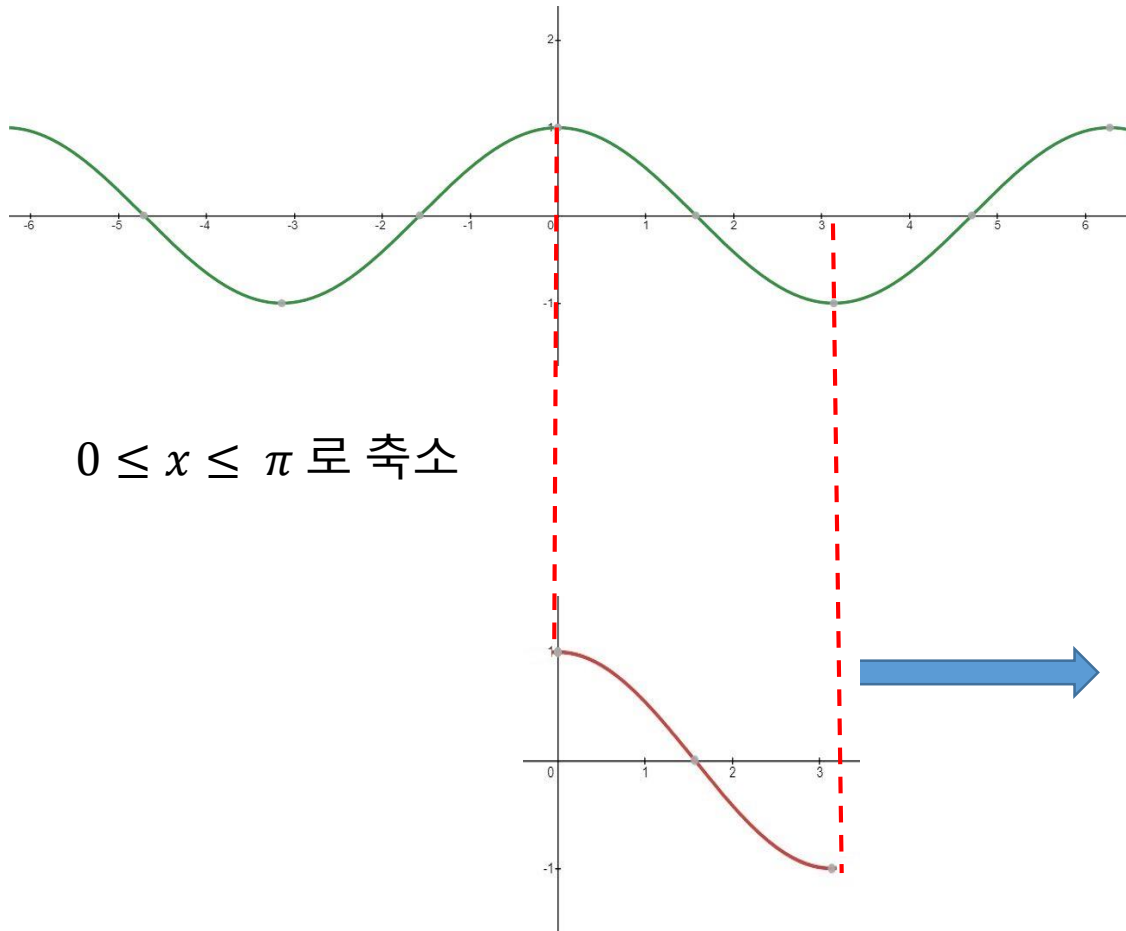
$$\sin^{-1} \frac{1}{2} = \frac{\pi}{6}$$

$$\sin^{-1} \frac{\sqrt{3}}{2} = \frac{\pi}{3}$$

$$\arcsin 1 = \frac{\pi}{2} = 90^\circ$$

$y = \cos x$ 의 역함수가 존재하는가?

일대일 함수가 아니므로 역함수가 존재하지 않는다.
일대일 함수로 만들기 위해서 정의역을 축소한다.

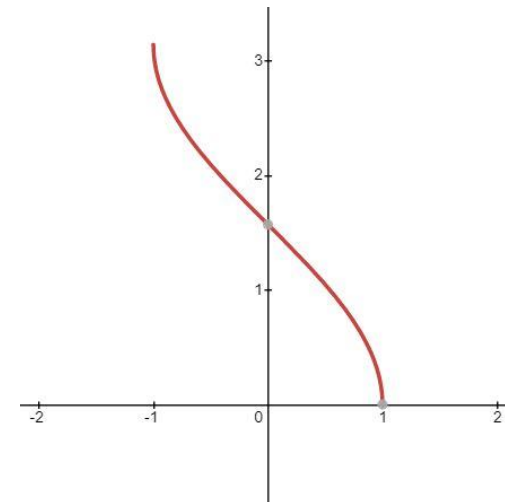


$0 \leq x \leq \pi$ 로 축소

$$= \arccos x$$

$$y = \cos^{-1} x \quad (-1 \leq x \leq 1, \quad 0 \leq y \leq \pi)$$

$$\neq \frac{1}{\cos x}$$



$$\cos^{-1} \frac{1}{2} = \frac{\pi}{3}$$

$$\cos^{-1} \frac{\sqrt{3}}{2} = \frac{\pi}{6}$$

$$\arccos(-1) = \pi$$

$$y = \tan x \text{ 의 역함수} \quad y = \tan^{-1} x \quad \left(\frac{\pi}{2} < x < \frac{\pi}{2} \right)$$

$$\tan^{-1}(1) = \frac{\pi}{4} \quad \tan^{-1}(-\sqrt{3}) = -\frac{\pi}{3}$$

p. 36

$$\text{예제 2.9} \quad \cos^{-1}\left(\cos \frac{\pi}{12}\right) = \frac{\pi}{12} \quad \cos(\cos^{-1} 0.4) = 0.4$$

p. 37

$$\text{예제 2.12} \quad \sin^{-1}\left(\sin \frac{5\pi}{4}\right) = \frac{5\pi}{4} (?) = -\frac{\pi}{4}$$

$$\cos^{-1}\left(\cos \frac{5\pi}{3}\right) = \frac{\pi}{3}$$

p. 40

예제 2.13 $\sin\left(\tan^{-1}\frac{1}{2}\right) = \frac{\sqrt{5}}{5}$

$$\cos\left(\sin^{-1}\left(-\frac{1}{3}\right)\right) = \frac{2\sqrt{2}}{3}$$

연습문제 1.2

#6. $\sin^{-1}\left(\cos\frac{3\pi}{4}\right) = -\frac{\pi}{4}$

#10. $\sec(\tan^{-1} v) = \sqrt{1 + v^2}$