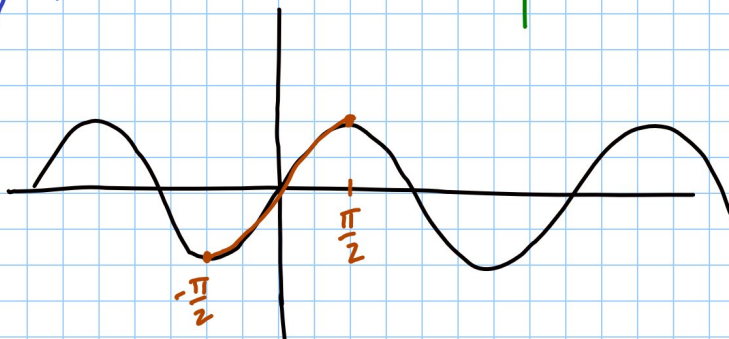
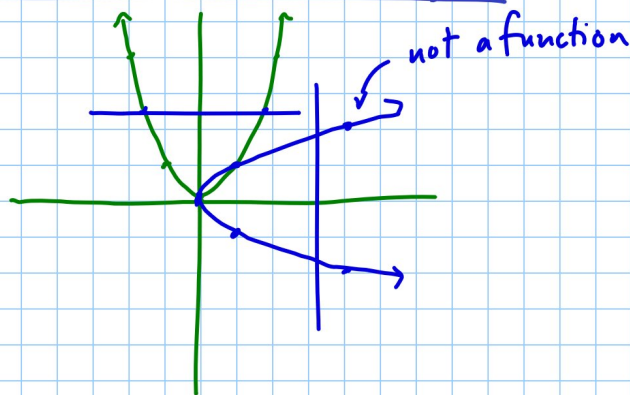
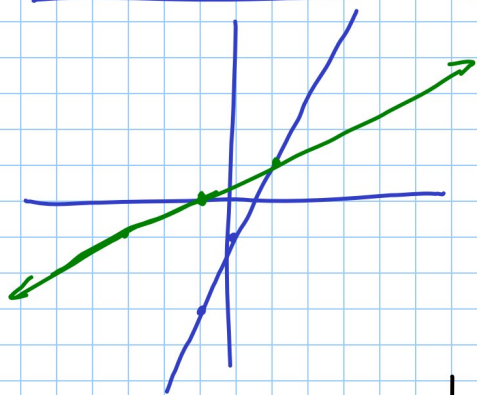


Section 6.1 Inverse Sine, Cosine, and Tangent



Inverse Sine

$\sin^{-1}x$ is asking for the angle between $-\frac{\pi}{2}$ and $\frac{\pi}{2}$ whose sine is x

$$\sin^{-1} \frac{\sqrt{2}}{2} = \frac{\pi}{4}$$

$$\sin^{-1} \left(-\frac{1}{2}\right) = -\frac{\pi}{6}$$

Inverse Cosine

$\cos^{-1}x$ is asking for the angle between 0 and π whose cosine is x

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

$$\cos^{-1} 1 = 0$$

Inverse Tangent

$\tan^{-1}x$ is asking for the angle between $-\frac{\pi}{2}$ and $\frac{\pi}{2}$ whose tangent is x

$$\tan^{-1} 1 = \frac{\pi}{4}$$

sine

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

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

$$\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right) = -\frac{\pi}{4}$$

$$\sin^{-1}\left(-\frac{1}{2}\right) = -\frac{\pi}{6}$$

$$\sin^{-1} 0 = 0$$

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

cosine

$$\cos^{-1}(-1) = \pi$$

$$\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right) = \frac{5\pi}{6}$$

$$\cos^{-1}\left(-\frac{\sqrt{2}}{2}\right) = \frac{3\pi}{4}$$

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

$$\cos^{-1} 0 = \frac{\pi}{2}$$

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

tangent

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

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

$$\tan^{-1}\left(-\frac{\sqrt{3}}{3}\right) = -\frac{\pi}{6}$$

$$\tan^{-1} 0 = 0$$

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

$$\sin^{-1} \frac{\sqrt{2}}{2} = \frac{\pi}{4}$$

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

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

$$\cos^{-1} \frac{\sqrt{2}}{2} = \frac{\pi}{4}$$

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

$$\cos^{-1} 1 = 0$$

$$\tan^{-1} 1 = \frac{\pi}{4}$$

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

ex: $\cos(\underbrace{\cos^{-1} \frac{\sqrt{2}}{2}}_{\text{today's chart}}) = \underbrace{\cos \frac{\pi}{4}}_{\text{Ch 5 Chart}} = \frac{\sqrt{2}}{2}$

$$\sin(\sin^{-1} \frac{14}{15}) = \frac{14}{15}$$

If \cos , \sin , or \tan are on outside of \cos^{-1} , \sin^{-1} , or \tan^{-1} , the functions cancel.

When inverse is on the outside evaluate the inside first.

$$\cos^{-1}(\cos \frac{11\pi}{6}) = \cos^{-1} \frac{\sqrt{3}}{2} = \frac{\pi}{6}$$

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