

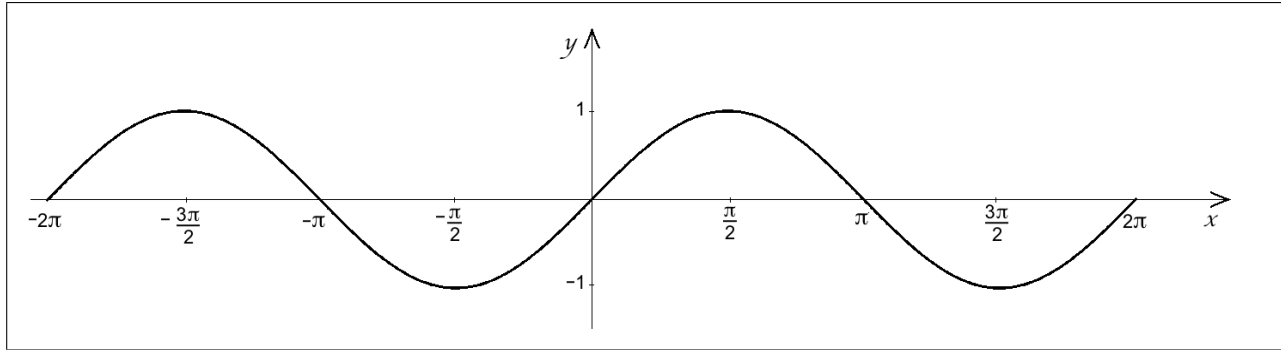
$$f(x) = \sin x$$

domain:  $\mathbb{R}$

range:  $[-1, 1]$

periodic with period  $2\pi$ : for all  $x$ ,  $\sin(x + 2\pi) = \sin x$

odd function: for all  $x$ ,  $\sin(-x) = -\sin x$



$$f(x) = \csc x = \frac{1}{\sin x}$$

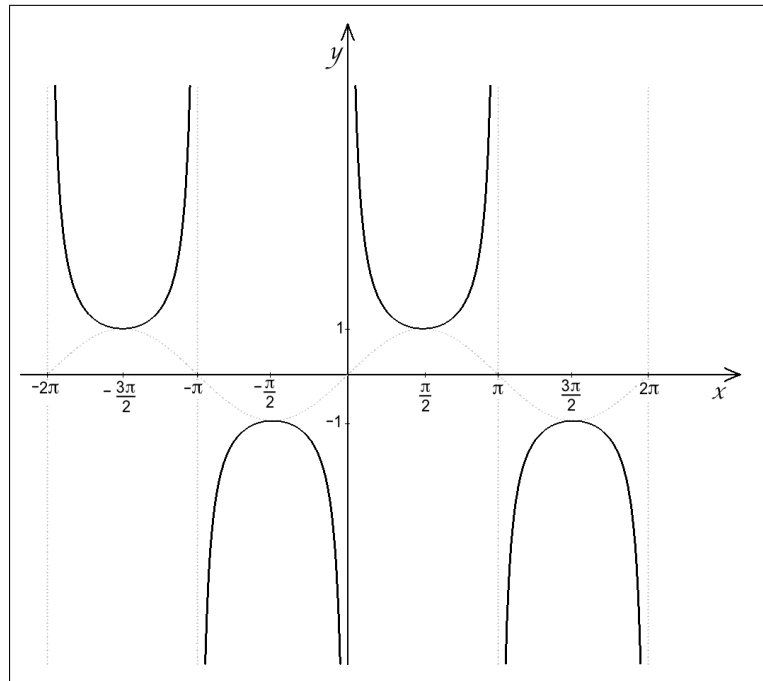
domain:  $x \neq k\pi$

range:  $(-\infty, -1] \cup [1, \infty)$

periodic with period  $2\pi$ : for all  $x$ ,  $\csc(x + 2\pi) = \csc x$

vertical asymptotes at  $x = k\pi$  where  $k \in \mathbb{Z}$

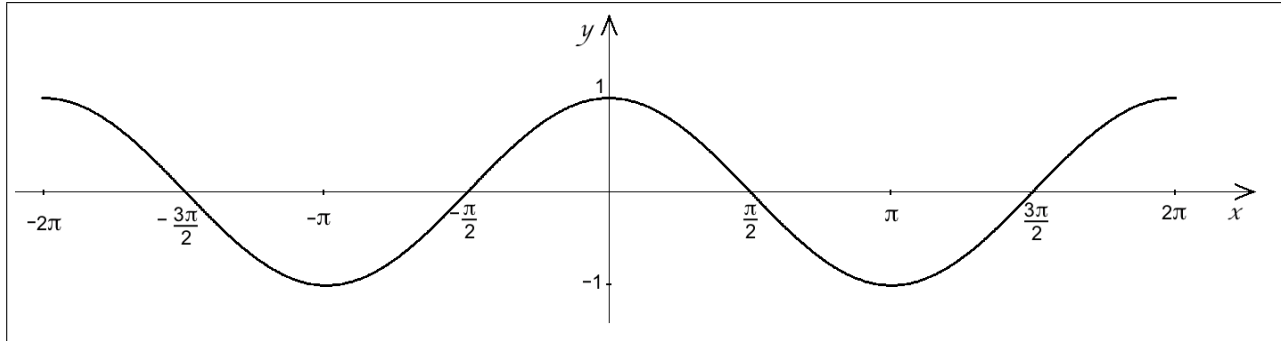
odd function: for all  $x$ ,  $\csc(-x) = -\csc x$



$$f(x) = \cos x$$

domain:  $\mathbb{R}$   
range:  $[-1, 1]$

periodic with period  $2\pi$ : for all  $x$ ,  $\cos(x + 2\pi) = \cos x$   
even function: for all  $x$ ,  $\cos(-x) = \cos x$

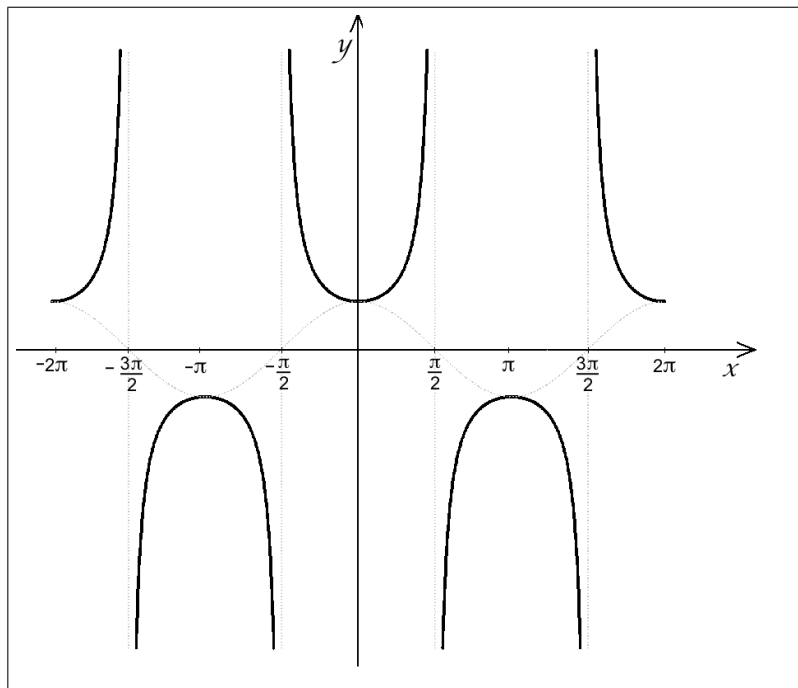


$$f(x) = \sec x = \frac{1}{\cos x}$$

domain:  $x \neq \frac{\pi}{2} + k\pi$  where  $k \in \mathbb{Z}$   
range:  $(-\infty, -1] \cup [1, \infty)$

vertical asymptotes at  $x = \frac{\pi}{2} + k\pi$  where  $k \in \mathbb{Z}$

periodic with period  $2\pi$ : for all  $x$ ,  $\sec(x + 2\pi) = \sec x$  even function: for all  $x$ ,  $\sec(-x) = \sec x$



$$f(x) = \tan x = \frac{\sin x}{\cos x}$$

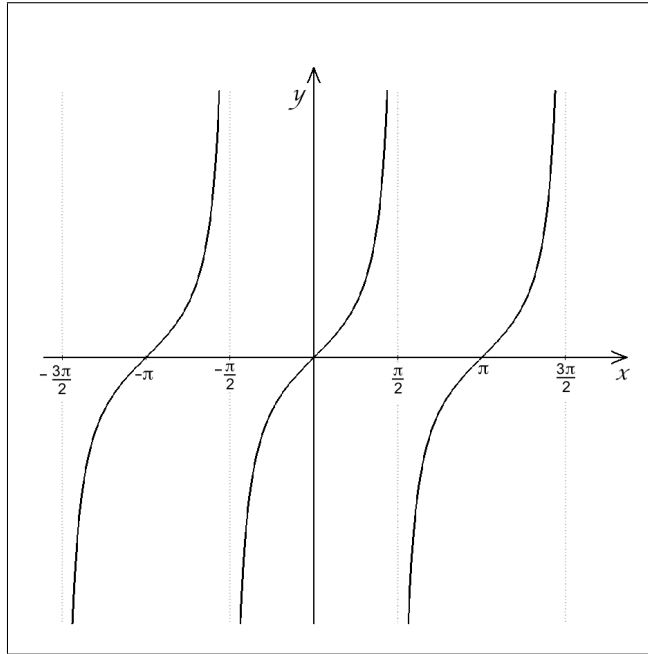
domain:  $x \neq \frac{\pi}{2} + k\pi$  where  $k \in \mathbb{Z}$

vertical asymptotes at  $x = \frac{\pi}{2} + k\pi$  where  $k \in \mathbb{Z}$

range:  $\mathbb{R}$

periodic with period  $\pi$ : for all  $x$ ,  $\tan(x + \pi) = \tan x$

odd function: for all  $x$ ,  $\tan(-x) = -\tan x$



$$f(x) = \cot x = \frac{\cos x}{\sin x}$$

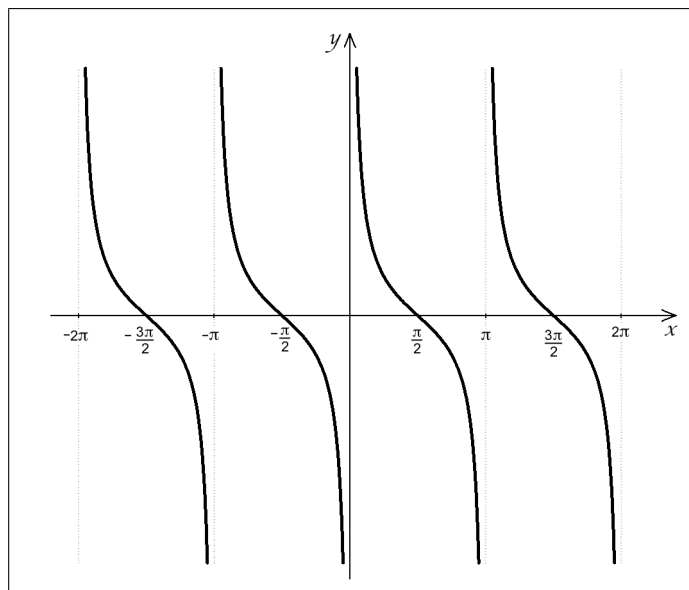
domain:  $x \neq k\pi$

vertical asymptotes at  $x = k\pi$  where  $k \in \mathbb{Z}$

range:  $\mathbb{R}$

periodic with period  $\pi$ : for all  $x$ ,  $\cot(x + \pi) = \cot x$

odd function: for all  $x$ ,  $\cot(-x) = -\cot x$



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