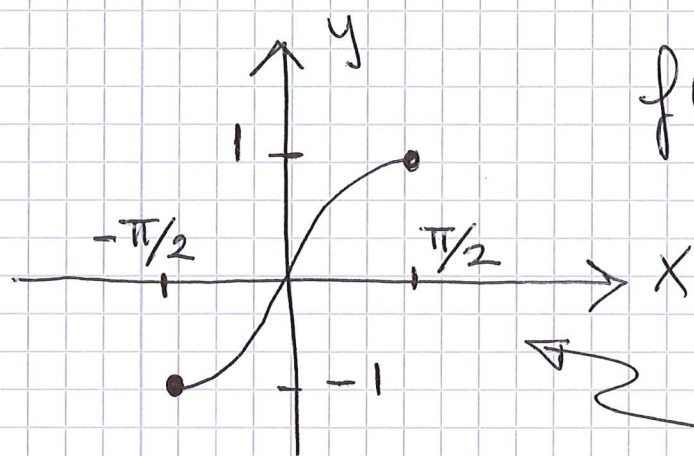


# F05 | Läs 2.5. Arcusfunktioner.



$f(x) = \sin x$  obs!  $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$

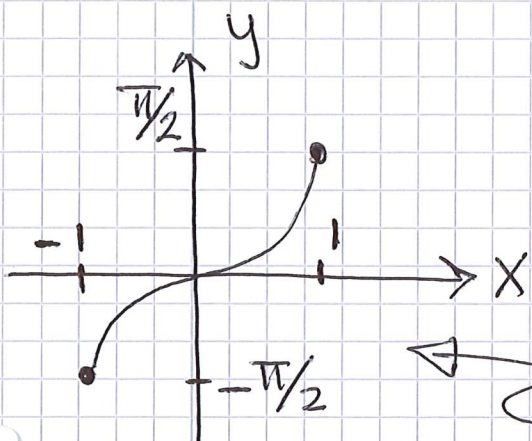
är injektiv  
har invers

$y = \sin x$

$\Leftrightarrow$  givet

$x = \arcsin y$

byt x mot y  
"speglning i linjen  $y=x$ "



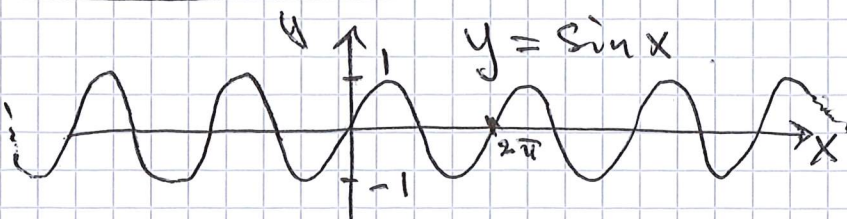
$x = \arcsin y$

$f^{-1}(x) = \arcsin x$

$D_{\arcsin x} = [-1, 1]$

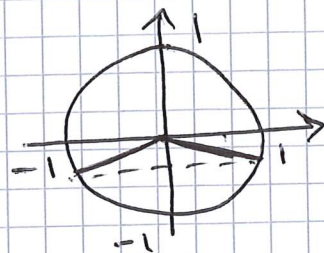
$V_{\arcsin x} = \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

"  
Vanlig sinus.  
ej injektiv.

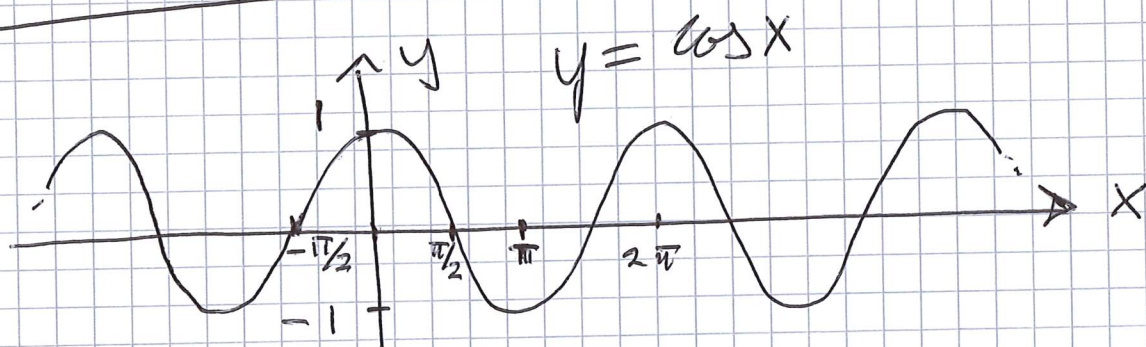


Ex. Lös ekv.  $\sin x = -\frac{1}{5}$

L:  $\sin x = -\frac{1}{5}$



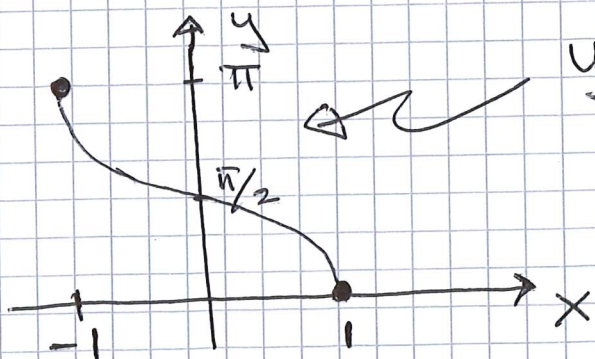
$$x = \begin{cases} \arcsin\left(-\frac{1}{5}\right) + n2\pi \\ \pi - \arcsin\left(-\frac{1}{5}\right) + n2\pi \end{cases} \quad n \in \mathbb{Z}$$



$y = \cos x$ , <sup>obs!</sup>  $0 \leq x \leq \pi$  har invers



$x = \arccos y$  byt  $x$  mot  $y$ .



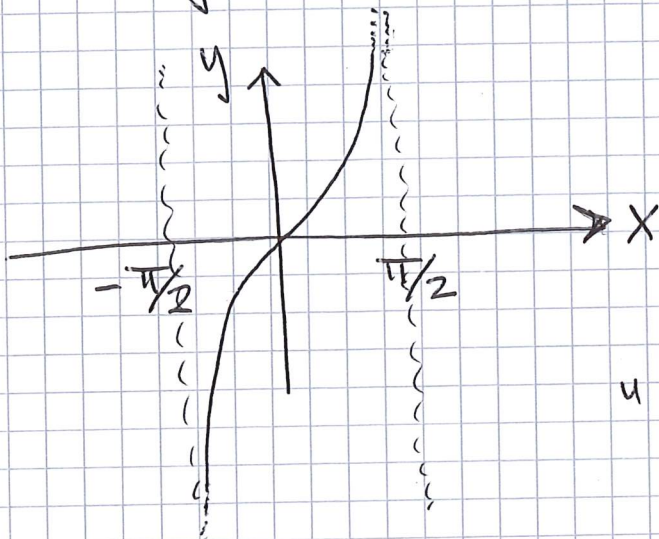
$y = \arccos x$

$-1 \leq x \leq 1$

$V_{\arccos x} = [0, \pi]$

Till sist  $\arctan x$ .

$$y = \tan x$$



obs!

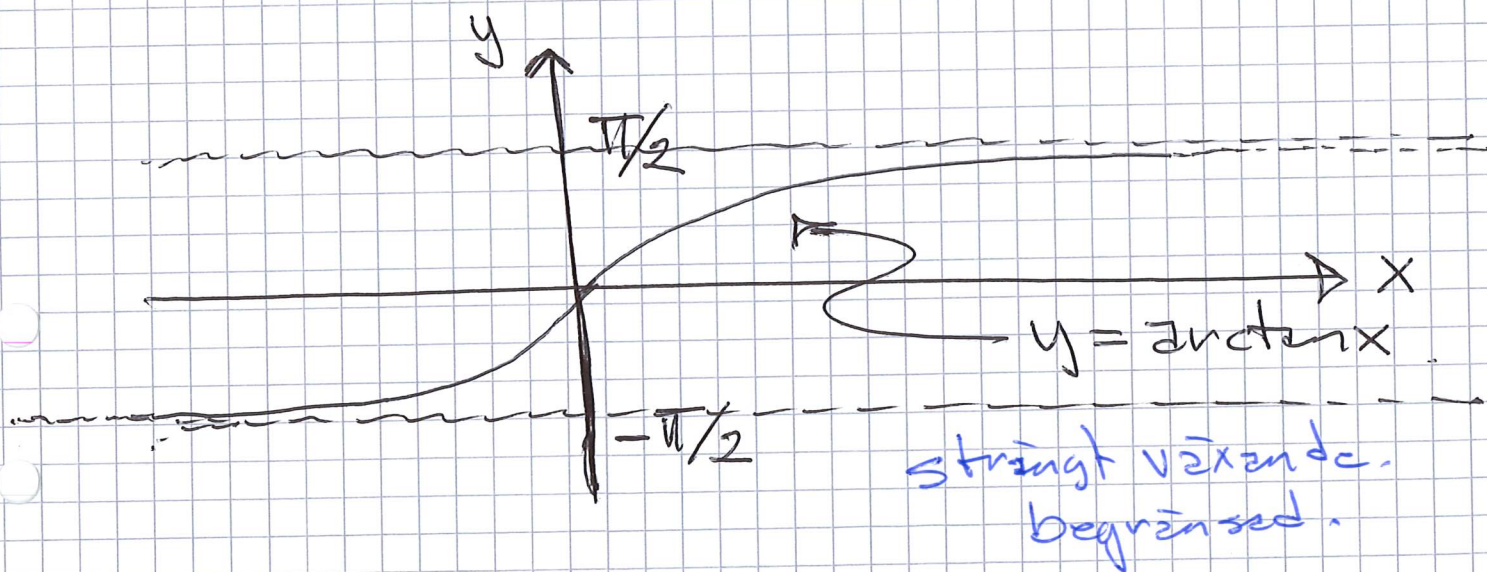
$$-\frac{\pi}{2} < x < \frac{\pi}{2}$$

$$x = \arctan y$$

byt  $x$  mot  $y$

" spegling i linjen  $y=x$  "

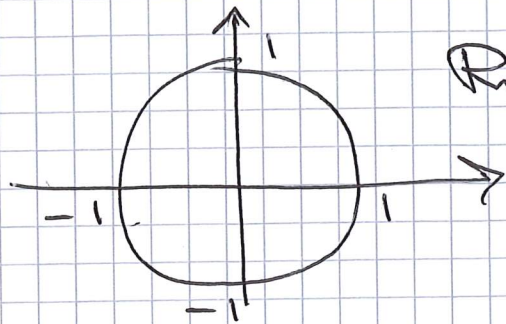
ger



$$D_{\arctan x} = \mathbb{R}$$

$$V_{\arctan x} = \left] -\frac{\pi}{2}, \frac{\pi}{2} \right[$$

Ex. Beräkna  $\arcsin\left(-\frac{1}{2}\right) = -\frac{\pi}{6}$



Rita enhetscirkeln.

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

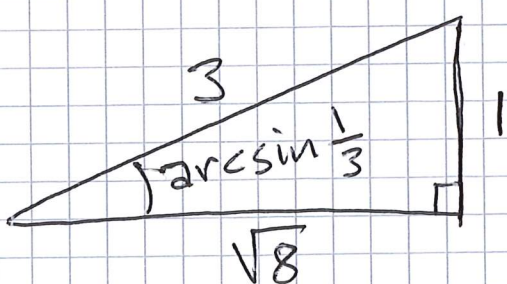
$$\arctan\left(\tan\frac{2\pi}{3}\right) = -\frac{\pi}{3}$$

↑

$$\tan\frac{2\pi}{3} = \tan\left(-\frac{\pi}{3}\right)$$

Ex.  $\sin\left(2 \underbrace{\arcsin\frac{1}{3}}_{\text{vinkel.}}\right) =$  / trig. formel.  $\sin 2v = 2 \sin v \cos v$

$$= 2 \sin \arcsin \frac{1}{3} \cos \arcsin \frac{1}{3} =$$



$$= 2 \cdot \frac{1}{3} \cdot \frac{\sqrt{8}}{3} = \frac{4\sqrt{2}}{9}$$