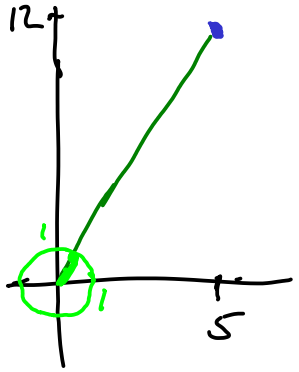
Rep Lekt 9



$$5\sin v + 12\cos v =$$

$$\sqrt{5^2+12^2} = \sqrt{169} = 13$$

$$= 13\left(\frac{5}{13}\sin v + \frac{12}{13}\cos v\right)$$

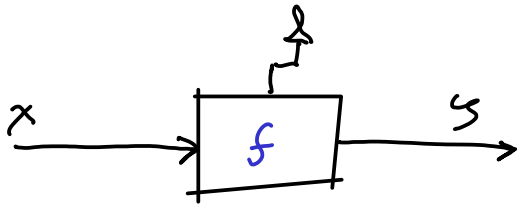
$= \cos(\theta)$ $\quad$ $= \sin(\theta)$

$$= 13(\cos\theta \sin v + \sin\theta \cos v) \qquad \theta = 1.1760$$

$$= 13 \sin(v+\theta) = 13\sin(v+1.1760)$$

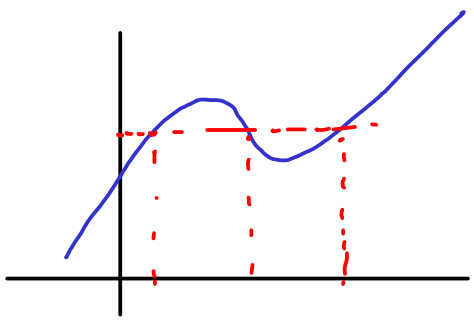
Svar: Största värde: 13

Funktionsmaskin



x	y
1	4
2	3
3	5
4	7

$y = f(x)$



Ex: $f(x) = 4 - x^2$

$f(x) = 3$

$4 - x^2 = 3$

$1 = x^2$

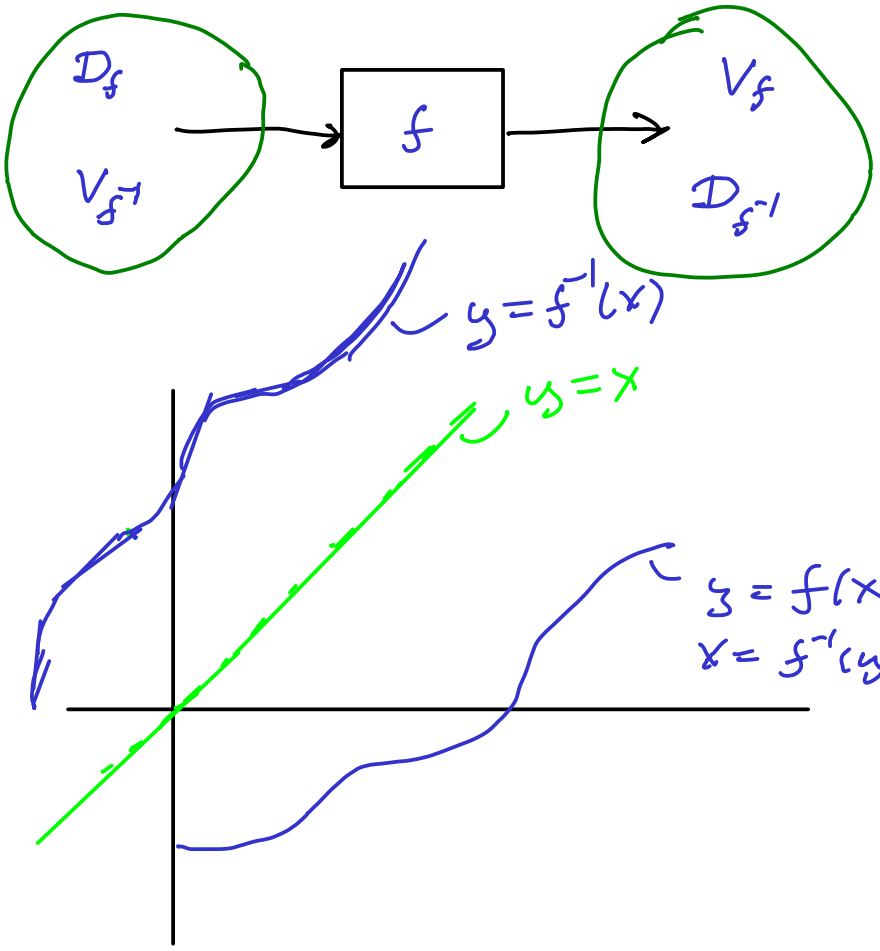
$x = 1$ eller $x = -1$

Omvändbarhet

$x_1 \neq x_2 \Rightarrow f(x_1) \neq f(x_2)$

ä- samma som

$f(x_1) = f(x_2) \Rightarrow x_1 = x_2$



x-

Ex:

$f(x) = \frac{x+1}{x-1} \qquad x \neq 1$

$y = f^{-1}(x)$

$f(y) = x$

$\frac{y+1}{y-1} = x$

$y+1 = x(y-1)$

$y+1 = x \cdot y - x$

$x+1 = x \cdot y - y$

$x+1 = (x-1)y$

$y = \frac{x+1}{x-1}$

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

Ex: $f(x) = \sqrt{x+1}$ $\quad D_f = [-1, \infty[$

$V_f = [0, \infty[$

$y = f^{-1}(x)$

$f(y) = x$

$\sqrt{y+1} = x$

$y+1 = x^2$

$y = x^2 - 1$

$f^{-1}(x) = x^2 - 1$ $\quad D_{f^{-1}} = [0, \infty[$

$V_{f^{-1}} = [-1, \infty[$

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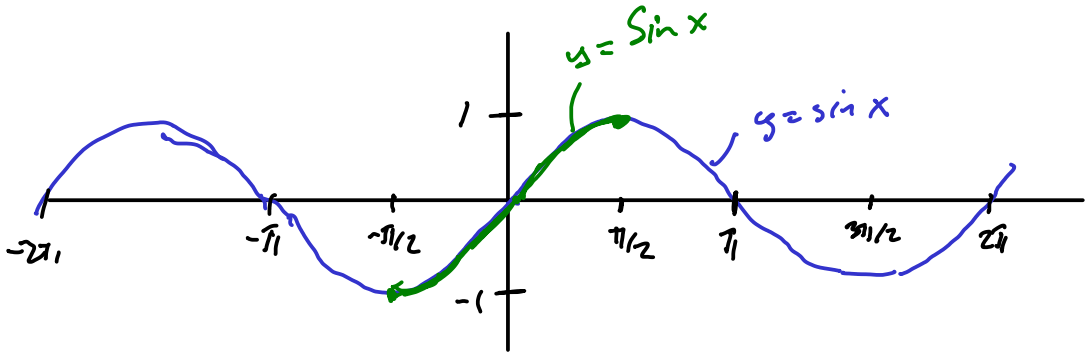
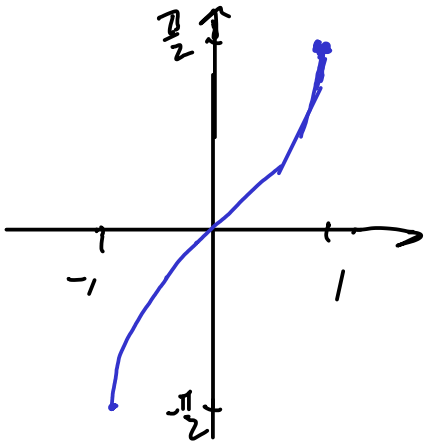
sinus & arcsinus



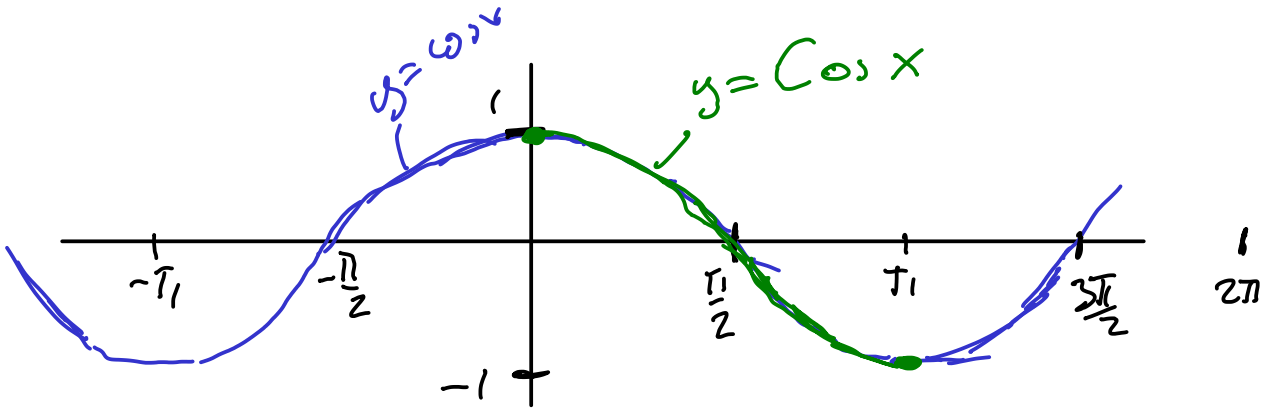
$y = \text{Sin } x$ $\quad V_{arcsin} = D_{Sin} = \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

Investigation

$y = \arcsin x$ $\quad D_{arcsin} = V_{Sin} = [-1, 1]$



cosinus & arccos



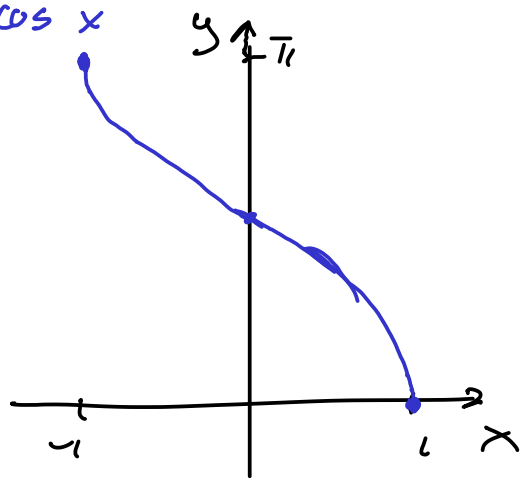
$y = \text{Cos } x$

$V_{\arccos} = D_{\text{Cos}} = [0, \pi]$

$D_{\arccos} = V_{\text{Cos}} = [-1, 1]$

invers funkt.

$y = \arccos x$



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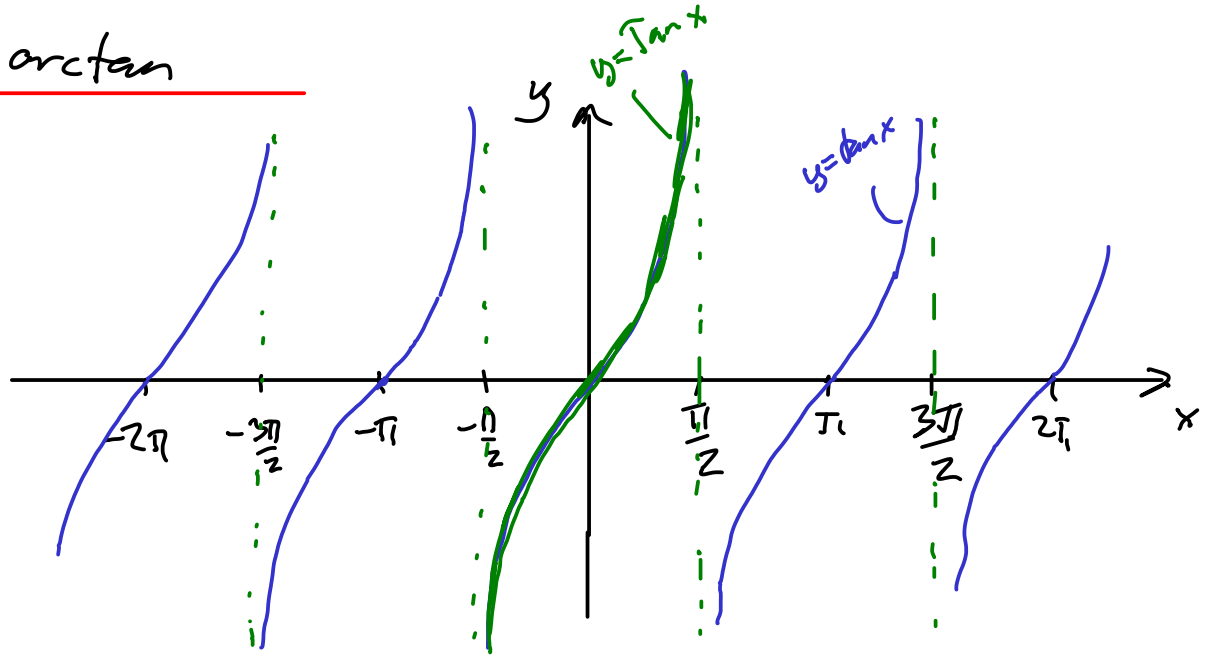
tan & arctan



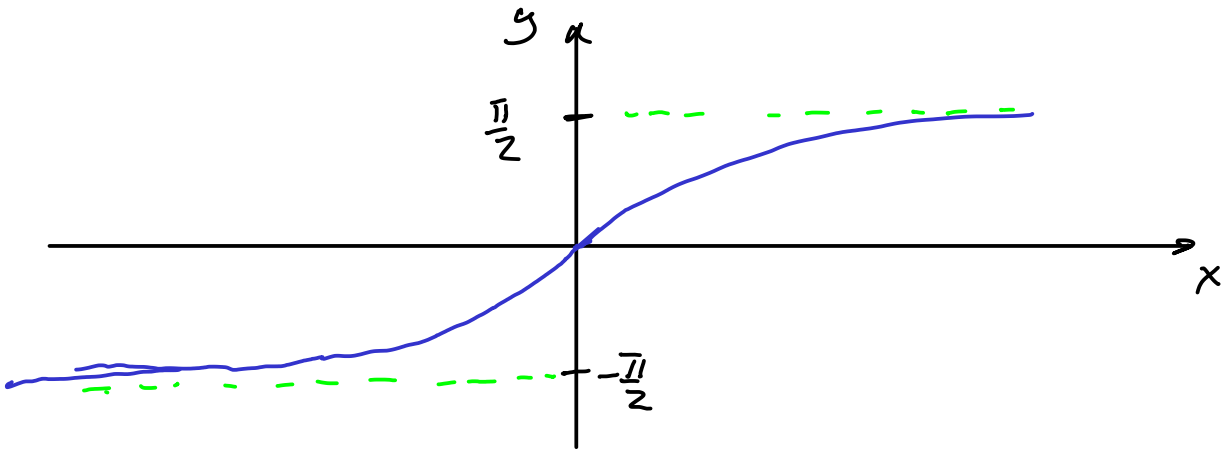
$y = \text{Tan } x$

$V_{\arctan} = D_{\text{Tan}} =]-\frac{\pi}{2}, \frac{\pi}{2}[$

$D_{\arctan} = V_{\text{Tan}} = \mathbb{R}$

invers funkt.

$y = \arctan x$



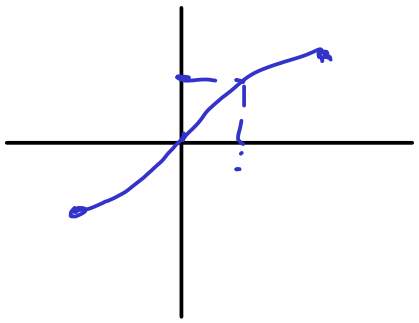
Ex:

$$\arcsin(\sin 0.3) = 0.3$$

$$-\frac{\pi}{2} < 0.3 < \frac{\pi}{2}$$

$$\arcsin\left(\sin \frac{3\pi}{4}\right) = \frac{\pi}{4}$$

Ex: $\cos(\arcsin 0.6)$ $\quad > 0$



$$= \pm\sqrt{1 - (\sin(\arcsin 0.6))^2}$$

$$= \pm\sqrt{1 - (0.6)^2} = \sqrt{1 - 0.36}$$

$$= \sqrt{0.64} = \frac{8}{10} = 0.8$$

$\cos^2\theta + \sin^2\theta = 1$

$\cos\theta = \pm\sqrt{1 - \sin^2\theta}$