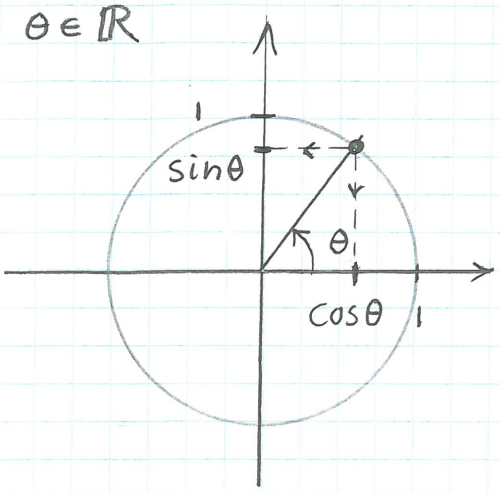
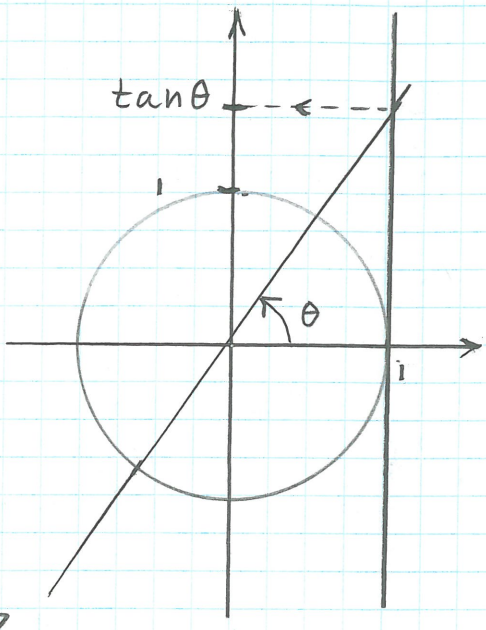
2. kursusgang : Repetition

Trigonometriske funktioner

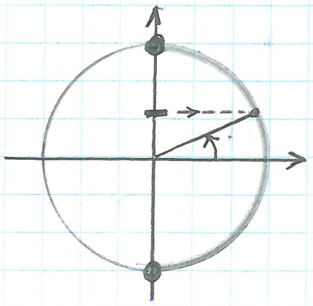
$\theta \in \mathbb{R}$





$$\tan\theta = \frac{\sin\theta}{\cos\theta} \; ; \; \theta \neq \frac{\pi}{2} + n\pi, \; n \in \mathbb{Z}$$

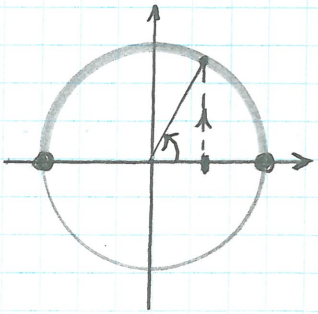
Inverse trigonometriske funktioner



$\sin : [-\frac{\pi}{2}, \frac{\pi}{2}] \longrightarrow [-1, 1]$ har invers

$\arcsin : [-1, 1] \longrightarrow [-\frac{\pi}{2}, \frac{\pi}{2}]$.

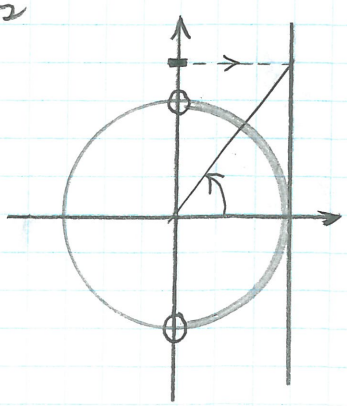
$$\frac{d}{dx} \arcsin(x) = \frac{1}{\sqrt{1-x^2}} \; , \quad -1 < x < 1.$$



$\cos : [0, \pi] \longrightarrow [-1, 1]$ har invers

$\arccos : [-1, 1] \longrightarrow [0, \pi]$.

$$\frac{d}{dx} \arccos(x) = -\frac{1}{\sqrt{1-x^2}} \; , \quad -1 < x < 1.$$



$\tan :]-\frac{\pi}{2}, \frac{\pi}{2}[\longrightarrow]-\infty, \infty[$ har invers

$\arctan :]-\infty, \infty[\longrightarrow]-\frac{\pi}{2}, \frac{\pi}{2}[$.

$$\frac{d}{dx} \arctan(x) = \frac{1}{1+x^2} \; .$$

Bemærk

$$\int \frac{1}{1+x^2} \, dx = \arctan(x) + C.$$

$$\int \frac{1}{\sqrt{1-x^2}} \, dx = \arcsin(x) + K$$
$$= -\arccos(x) + L \; , \quad -1 < x < 1.$$

Opgaverne

True / False : Se side A-52 for hints og løsninger.

$\sin^{-1}$ = arcsin

$\cos^{-1}$ = arccos

$\tan^{-1}$ = arctan

$D_x = \frac{d}{dx}$

Husk:

θ	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$
$\sin\theta$	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
$\cos\theta$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$

$$(f(g(x)))' = f'(g(x)) \cdot g'(x)$$