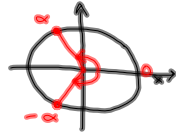


SIN JA COS OMINAISUUKSIA

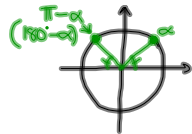
Kulma & Vastakulma



* Sama x-koordinaatti
 $\rightarrow \cos \alpha = \cos(-\alpha)$

* y-koordinaatit vastalukupa
 $\sin \alpha = -\sin(-\alpha)$
 eli $\sin(-\alpha) = -\sin \alpha$

Kulma ja supplementikulma



* x-koordinaatit vastalukupa

$$\cos \alpha = -\cos(\pi - \alpha)$$

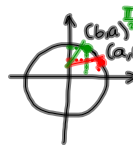
$$\text{tai } \cos(\pi - \alpha) = -\cos \alpha$$

* y-koordinaatit samoja

$$\sin \alpha = \sin(\pi - \alpha)$$

\Rightarrow ESM2 s.43 (ja moniste)

Vaihesiirto \rightarrow sinin ja kosinin muuttaminen toisikseen komplementtikulmat



$$\cos \alpha = \sin\left(\frac{\pi}{2} - \alpha\right)$$

$$\sin \alpha = \cos\left(\frac{\pi}{2} - \alpha\right)$$

(s.45) ESM 3

s.46-47

93	\rightarrow	kokonaisia
95		kieroksia
97		110
98		112
100		113
101		
104		

$$\begin{aligned} \sin \frac{9\pi}{2} &= \sin\left(\frac{\pi}{2} + \frac{8\pi}{2}\right) \\ &= \sin\left(\frac{\pi}{2} + 2 \cdot 2\pi\right) \\ &= \sin \frac{\pi}{2} \\ &= 1 \end{aligned}$$

