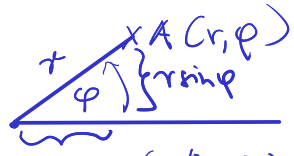
Matematika 4, 5. svibnja 2021.

φ kut

r udaljenost od ishodišta

u $\mathbb{R}^2$ $\quad r=\sqrt{x^2+y^2}$



$r=\sqrt{x^2+y^2}$

$\operatorname{tg}\varphi=\frac{y}{x}$

$(r,\varphi)\in(\mathbb{R}_0^+\setminus\{0\})\times[0,2\pi)$ polarne koordinate

na $\mathbb{R}^2\setminus\{(0,0)\}$ polarni koordinatni sustav

$r=$ konstanta (R)

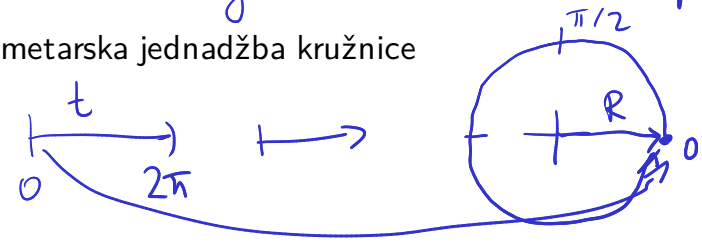
φ je bilo koliko

$(O,\vec{i},\vec{j})$ koordinatni sustav u ravnini M^2

$x=r\cos\varphi$
$y=r\sin\varphi$

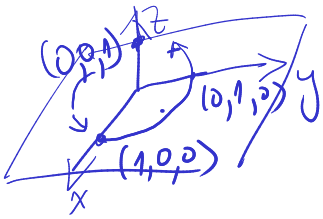
$r=R$ jednadžba kružnice u polarnim koordinatama

parametarska jednadžba kružnice



$t\mapsto(R,t)$ u pol. koord.

$t\mapsto(\underbrace{R\cos t}_{x},\ R\sin t)$



kružna spirala

proporcionalno

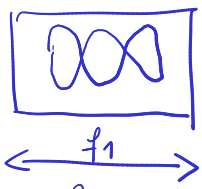
$z\propto t$

koef. prop. $k\in\mathbb{R}$

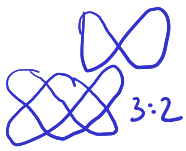
$x=R\cos t$
$y=R\sin t$
$z=kt$

spirala u $\mathbb{R}^3$

LISSAJOUS



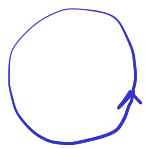
$f_1:f_2=$ mali racionalni broj



2:3 3:2 3:4 3:2

f frekvencija = „čestota" = broj događaja u sekundi (za periodička zbivanja)

kružna frekvencija $=2\pi f=\omega$



$x=R\cos\omega t$ $\quad f=1,\ \omega=2\pi$

$y=R\sin\omega t$

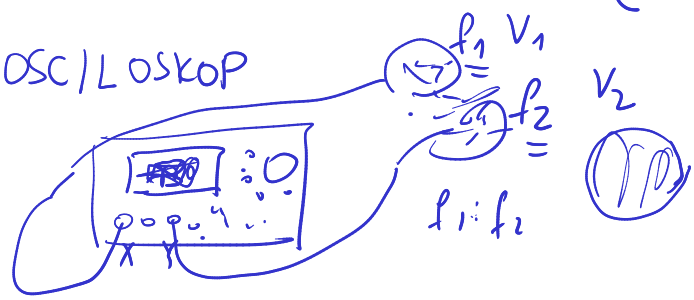
$R\cos t$

$x=R\cos 2\pi t$ $\quad t\in[0,1)$

$y=R\sin 2\pi t$

1 puni krug

OSCILOSKOP



$x=R\cos\omega_1 t$

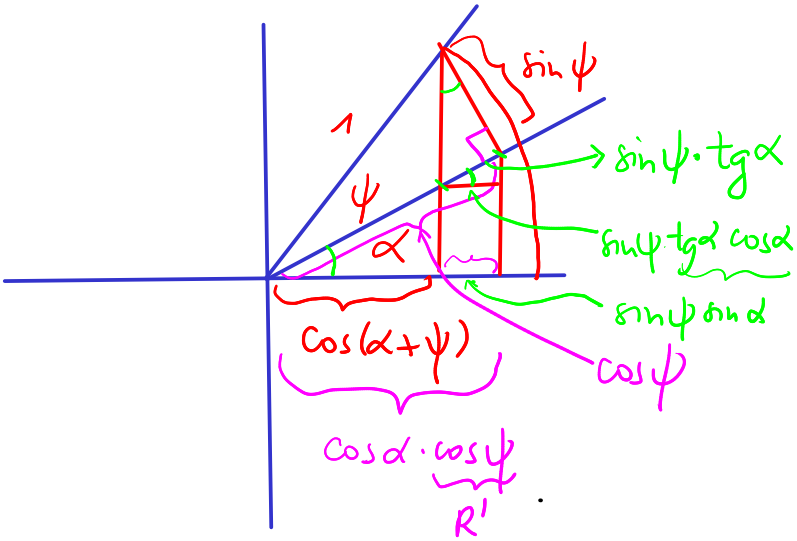
$y=R\cos\omega_2 t$

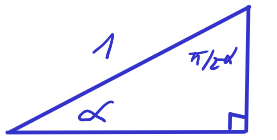
$\omega_1:\omega_2=$ mali „razlomak"

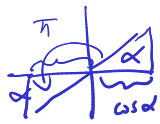
mali brojnik i nazivnik

https://en.wikipedia.org/wiki/Lissajous_curve

Adicijske formule za trigonometrijske funkcije
(formule za trigonometrijske funkcije od zbroja)







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

$\cos(\alpha+2\pi) = \cos\alpha$

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

$\cos(\alpha+\psi)$

$\cos\pi = -1$

$\cos 2\pi = 1$

$\cos\frac{\pi}{2} = 0$

$\sin\frac{\pi}{2} = 1$

$$\cos(\alpha+\psi) = \cos\alpha\cos\psi - \sin\alpha\sin\psi$$
$$\sin(\alpha+\psi) = \sin\alpha\cos\psi + \cos\alpha\sin\psi$$

$$\underbrace{\begin{pmatrix}\cos\alpha & -\sin\alpha\\ \sin\alpha & \cos\alpha\end{pmatrix}}_{\text{rot za } \alpha}\underbrace{\begin{pmatrix}\cos\psi & -\sin\psi\\ \sin\psi & \cos\psi\end{pmatrix}}_{\text{rot za } \psi} = \begin{pmatrix}\cos\alpha\cos\psi - \sin\alpha\sin\psi & -(\cos\alpha\sin\psi + \sin\alpha\cos\psi)\\ \sin\alpha\cos\psi + \cos\alpha\sin\psi & -\sin\alpha\sin\psi + \cos\alpha\cos\psi\end{pmatrix}$$

$$\text{rot za } \alpha+\psi$$

$$\begin{pmatrix}\cos(\alpha+\psi) & -\sin(\alpha+\psi)\\ \sin(\alpha+\psi) & \cos(\alpha+\psi)\end{pmatrix}$$

Vidi također stranicu

https://ncatlab.org/zoranskoda/show/adicioni+teoremi