Parametriseringar

- Cirklar
- Ellipsar

(1) Funktionens kurvor $\{y = f(x)\}$

ex) $y = 3x - 2$

Välj t.ex $x = t$ då $y = 3t + 2$ $(r(t) = (t, 3t+2))$

(2) Cirklar

konstant!

$x^2 + y^2 = \rho^2$ $\quad \rho > 0$

$x(t) = \rho \cos(t)$ $\quad 0 \leq t \leq 2\pi$

$y(t) = \rho \sin(t)$

ex)

$(x-4)^2 + (y+2)^2 = 36$

$$r(t) = \begin{bmatrix} x(t) = 6\cos(t) + 4 \\ y(t) = 6\sin(t) - 2 \end{bmatrix}$$

(3) Ellipsen

ex) $4x^2 + \frac{y^2}{9} = 36$

$\Rightarrow (2x)^2 + (\frac{1}{3}y)^2 = 6^2$

$$\begin{cases} 2x = 6\cos(t) \\ \frac{y}{3} = 6\sin(t) \end{cases} = \begin{cases} x = 3\cos(t) \\ y = 18\sin(t) \end{cases}$$

Param av skärningskurva

ex $\begin{cases} 9x^2 + 25y^2 = 225 = 15^2 \\ 4y + 3z = 0 \end{cases}$

Steg 1

Param ekv

$x = 5\cos(t)$ $\left\{ \frac{15}{3}\cos(t) \right.$, $0 \leq t \leq 2\pi$

$y = 3\sin(t)$

Steg 2

hitta z

$4y + 3z = 0 \Rightarrow z = -4\sin(t)$

$r(t) = \{5\cos(t), 3\sin(t), -4\sin(t)\}$

Längden

$S = L = \int r(t)\,dt = \int \|\vec{r}\|\,dt$

$= L = \int_0^{2\pi} \|r'(t)\|\,dt = \int_0^{2\pi} \sqrt{25}\,dt = 10\pi$