Monotoniforhold

Vektorfunktion

$$\vec{r}(t) = \begin{pmatrix} x(t) \\ y(t) \end{pmatrix}$$

- $y'(t) > 0$ så beveger partikkelen sig op
- $y'(t) < 0$ — // — ned
- $x'(t) > 0$ — // — højre
- $x'(t) < 0$ — // — venstre

Eks

$$\vec{r}(t) = \begin{pmatrix} t^2 - t + 6 \\ t^4 - 2t^2 \end{pmatrix} = \begin{pmatrix} x(t) \\ y(t) \end{pmatrix}$$

- $x'(t) = 2t - 1 = 0 \Rightarrow t = 1/2$
- $y'(t) = \underset{-4}{4t^3} - \underset{+4}{4t} = 0 \Rightarrow t = 0,\ t = 1,\ t = -1$

- $x'(0) = 2 \cdot 0 - 1 = -1 \Rightarrow$ aft.
- $x'(1) = 2 \cdot 1 - 1 = 1 \Rightarrow$ voks.

Monotoniforhold:

$x(t)$ er aftagende for $t \in (-\infty, 1/2]$

$x(t)$ er voksende for $t \in [1/2, \infty)$

For y: toppunkter $0; 1, -1$

$y(t) = 4t^3 - 4t$

- $y(-2) = 4(-2)^3 - 4 \cdot (-2) = -24$
- $y(-1/2) = \underbrace{4 \cdot (-1/2)^3}_{-1/2} - \underbrace{4 \cdot (-1/2)}_{+2} = 3/2$
- $y(1/2) = 4 \cdot (1/2)^3 - 4 \cdot 1/2 = -3/2$
- $y(2) = 24$