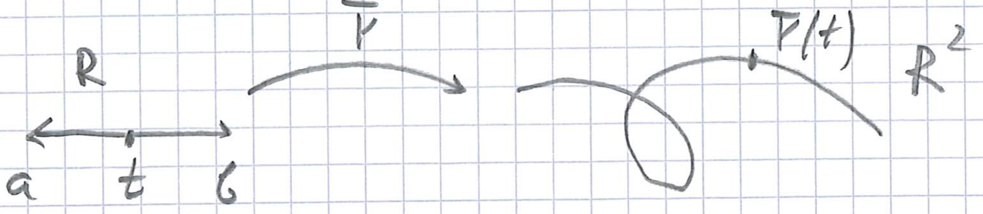
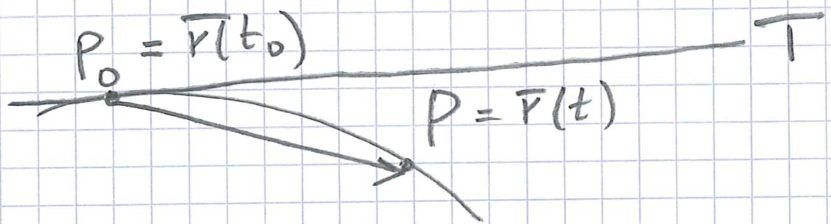
# Motivering 1

$$\bar r(t) = (x(t), y(t)) : (a,b) \subset R_t \to R^2_{(x,y)}$$




$$\overline{P_0 P} = (x(t) - x(t_0),\ y(t) - y(t_0))$$

**Obs** 1) $\dfrac{1}{t - t_0} \cdot \overline{P_0 P} \parallel \overline{P_0 P}$ $\underline{o}$

$$\frac{1}{t-t_0} \overline{P_0 P} = \left( \frac{1}{t-t_0} (x(t) - x(t_0)),\ \frac{1}{t-t_0} (y(t) - y(t_0)) \right)$$

2) Om $t \to t_0$ så är $P \to P_0$ $\underline{o}$

$$\begin{cases} \dfrac{1}{t-t_0} (x(t) - x(t_0)) \longrightarrow x'(t_0) \\ \dfrac{1}{t-t_0} (y(t) - y(t_0)) \longrightarrow y'(t_0) \end{cases}$$

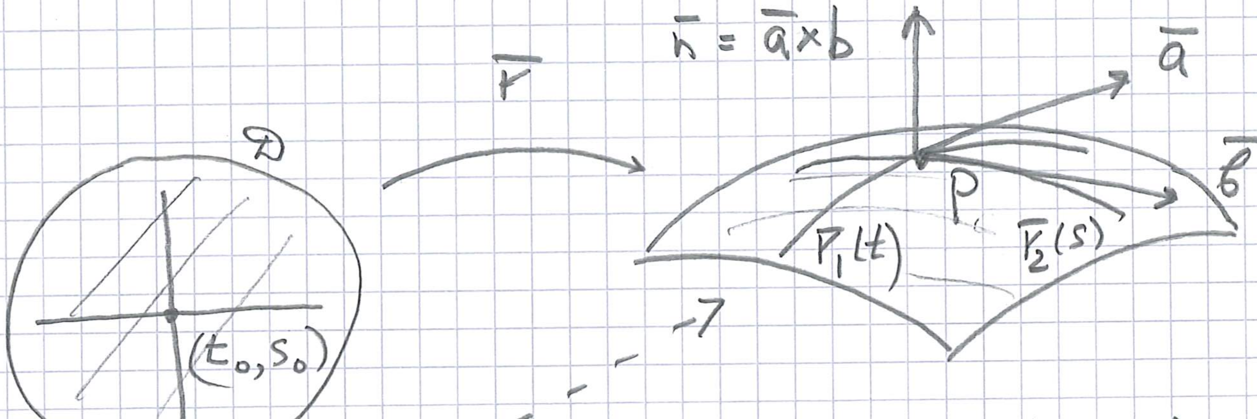
d v s

$$\frac{1}{t-t_0} \overline{P_0 P} \to (x'(t_0), y'(t_0)) = \frac{d\bar r}{dt}(t_0)$$

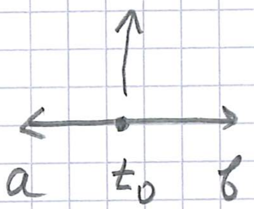
<u>tangent vektor</u>

## Motivering 2 (2-dimensionell yta ...)

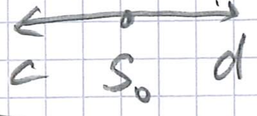
$$\bar{r}(t,s) = (x(t,s), y(t,s), z(t,s)) : \mathcal{D} \subseteq \mathbb{R}^2_{t,s} \to \mathbb{R}^3_{xyz}$$




$$P = \bar{r}(t_0, s_0)$$




$$\bar{r}_1(t) = \bar{r}(t, s_0) : (a,b) \subseteq \mathbb{R}_t \to \mathbb{R}^3_{xyz}$$

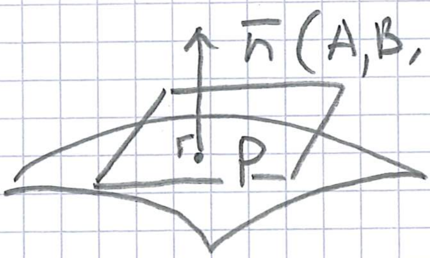



$$\left( \; , \; \bar{r}_2(s) = \bar{r}(t_0, s) : (c,d) \subseteq \mathbb{R}_s \to \mathbb{R}^3_{xyz} \right)$$

Obs 1) $\bar{r}_1(t_0) = \bar{r}_2(s_0) = P(x_0, y_0, z_0)$

2) $\bar{a} = \dfrac{d\bar{r}_1}{dt}(t_0)$ o $\bar{b} = \dfrac{d\bar{r}_2}{ds}(s_0)$

3) $\bar{n} = \bar{a} \times \bar{b} \perp$ ytan

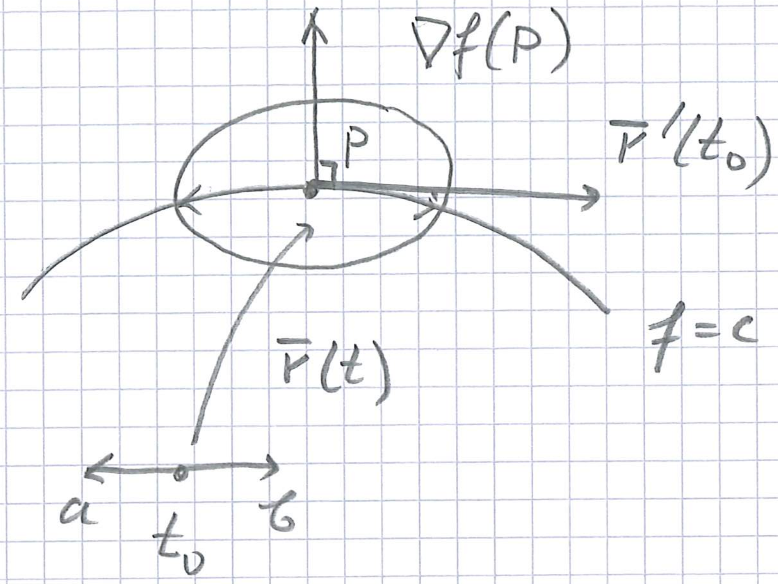



$$A(x-x_0) + B(y-y_0) + C(z-z_0) = 0$$

(tangentplan i P till ytan)

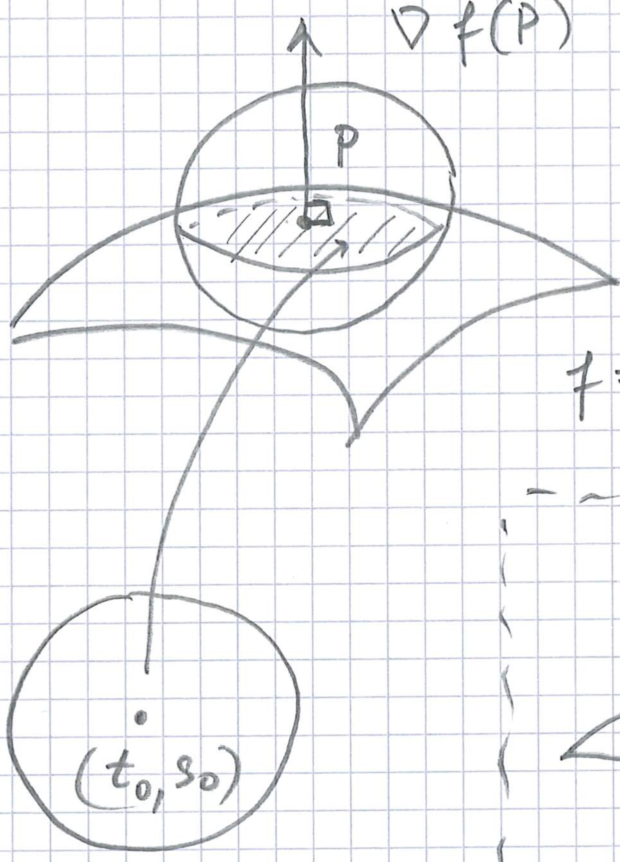
# Motivering 3 (Sats 1)

(i planet)




$f = c$ (en nivåkurva)

(i rummet)




$f = c$ (en nivåyta)